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YELLOWSTONE NATIONAL PARK, BASELINE WATER QUALITY SURVEY REPORT

William J. Keffer, et al

Environmental Protection Agency
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1972

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The report summarizes and evaluates water quality data obtained from the May 1970 to September 1970 investigation of the surface waters of Yellowstone National Park. A brief description of climatic conditions, streamflows and past water studies is presented along with recommendations for actions to preserve and enhance existing conditions. Special appendices present detailed discussions of mine drainage in Soda Butte Creek, sewage treatment facilities evaluations, pesticide and radiological results and a summary of ranges and means of chemical, and microbiological and biological data for park waters.

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YELLOWSTONE NATIONAL PARK
BASELINE WATER QUALITY SURVEY REPORT

ENVIRONMENTAL PROTECTION AGENCY

REGIONS VII AND VIII

1972

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ABSTRACT

The report summarizes and evaluates water quality data obtained from the May 1970 to September 1970 investigation of the surface waters of Yellowstone National Park. Water quality analyses were made at some 100 sites located in and adjacent to the Park. The report presents physical, chemical, biological, microbiological, radiological and pesticides data. Causes and effects of water quality changes are evaluated and recommendations are made for actions to preserve and enhance existing conditions.

INTRODUCTION

The Missouri Basin Region of the Federal Water Quality Administration[1] conducted an extensive survey of the waters of Yellowstone National Park during 1969 and 1970.

Objectives of the water quality survey were:

1. Establish a baseline measure of the physical, chemical, and biological quality of area waters.

2. Evaluate the effects on aquatic ecosystems from sediment and chemical contaminants from mining activities in the headwaters of Soda Butte Creek, an area outside of the Park boundaries.

3. Evaluate the operation and maintenance of wastewater treatment facilities and determine the impact of effluent discharges.

The general approach selected to provide information to meet these objectives is outlined below.

1. Chemical survey of water quality conditions in Soda Butte Creek Drainage - May to December 1969. (Subsequent investigations of the water quality problems of Soda Butte Creek have been made since the baseline survey of the Park. These investigations, along with the findings of the 1969 survey are published in a separate report -- A Report Covering the Joint EPA-USFS-Montana Inspection of Selected Mining Areas, Cooke City, Montana Mining District. U. S. Environmental Protection Agency, Region VIII, December 1972)

2. Biological investigation oriented toward evaluation of levels of disruption of the natural aquatic ecologic system through the activities of man in the Park - July 1970.

3. Installation of an automatic monitoring device to record the diurnal variations of several commonly observed water quality parameters to assist in evaluating the biologic activity in various portions of the study area - June 1970.

4. Waste treatment plant operation evaluation survey. The operation and control of the waste treatment devices in the Park were measured and studied to provide interpretive assistance to data evaluation efforts and to assist the Park Service in obtaining the maximum waste treatment possible with existing units - August 1970.

1/ The Federal Water Quality Administration was transferred to the Environmental Protection Agency on December 2, 1970. Regional EPA responsibilities for the Yellowstone National Park area were shifted from Region VII in Kansas City to Region VIII in Denver on July 1, 1971 as the result of a realignment of regional boundaries.

5. Chemical and microbiological data collection efforts were carried out in May and August of 1970. The two 4-week sample collection and analyses efforts were carried out to determine concentrations of approximately thirty different water quality parameters at nearly sixty locations in the Park area.

SUMMARY AND CONCLUSIONS

1. The quality characteristics of the waters within the Park are unique due to the naturally occurring geothermal phenomena of the region. The unique chemical and physical characteristics of the waters along with the unique biological communities found in the Park set the waters of Yellowstone National Park apart from other waters in the world.

2. The mandate expressed by Congress in the establishment of Yellowstone National Park requires that the unique resources of the Park be preserved in their natural condition.

3. The evaluation of water quality has shown that the quality is generally excellent, and that human activity in the Park has not caused degradation to any discernible degree, except in some limited areas.

4. In the areas of pronounced geyser activity, stream quality characteristics change significantly due to the inflow of thermal waters. These effects were noted on the Gibbon, Firehole, Madison, and Gardner Rivers and on Pelican Creek. Local effects from thermal waters were noted in Yellowstone Lake near the Beach Springs area of Mary Bay.

5. Yellowstone Lake is an oligotrophic body of water with a relatively deep benthic productive area occurring in the twenty to thirty foot range. The benthos and phytoplankton collected in 1970, when compared with previous studies on the Lake during 1954-1959, indicated no significant change in species composition. Areas of degradation caused by sewage disposal or other man-related activities centered around the Lake were not evidenced by the presence or absence of bottom organisms.

6. The stream benthos and periphyton reflected water of excellent quality throughout the Park, with the exception of Soda Butte Creek. The flora and fauna of the Park streams have remained relatively unchanged since the first intensive surveys in 1929. All streams sampled upstream and downstream from visitor centers exhibited bottom organism communities typical of unpolluted mountain streams.

7. In the vicinity of Cooke City, Montana, a decrease of numbers and types of bottom organisms in Soda Butte Creek indicated marginal water quality. Heavy sediment deposits and toxic materials leaching from upstream mine tailings severely affected aquatic life in this area. However, the

stream benthos in the downstream reaches within the Park improved in numbers and types indicating recovery in the Lamar River below its Junction with Soda Butte Creek.

8. No significant fecal pollution directly attributable to human discharges were identified in the waters of the study area. Maximum fecal coliform counts were recorded during the previsitation period at 14 of the 23 stations sampled, thus indicating the source being animal wastes in spring runoff. Eight of the remaining nine stations had maximum counts of less than 100 colonies per 100 ml. The only station exceeding a count of 100 colonies/ 100 ml. during the period of summer use was on the Yellowstone River below Gardiner, Montana.

9. Automatic monitor operation at selected locations failed to reveal any significant diurnal variations of water quality.

10. The investigation found that many wastewater treatment facilities were no longer adequate to meet the demands of increased visitation. However, construction of new or modified facilities is either underway or being planned to upgrade treatment at all major visitor centers. Many treatment facilities in the Park had no back-up systems to keep them operating if electrical or mechanical failures occur.

11. Additional attention to the operation and maintenance of wastewater treatment works is needed. Consistent and improved performance from treatment facilities can be achieved through better operational control. The number of personnel assigned to wastewater management was insufficient to allow adequate time for operational control. Proper operation will become increasingly important considering that planned facilities will be much more complex than existing systems.

12. The potential for degradation of Yellowstone Lake exists from the existing direct discharges of treated effluent to the lake. A policy of no direct discharges to the lake has been established for the new treatment facilities. The no discharge policy has also been applied to all other new facilities except Canyon Village where it wasn't deemed necessary at this time. Evaporation-percolation lagoons will be used for final effluent disposal to minimize the potential threat to aquatic systems from discharges of excessive amounts of nutrients.

13. Daily increases in turbidity of the Firehole River were caused by road construction activity near the Old Faithful area.

14. Traces of chlorinated hydrocarbon pesticides were detected in the Snake, Madison, and Yellowstone Rivers. The maximum levels found did not exceed those background values found in other areas of minimal pesticides use.

RECOMMENDATIONS

1. A water quality monitoring system and data collection program should be instituted to detect changes in quality resulting from man's use of the Park.

2. Water quality standards should be established to assure that the waters of the Park are maintained in their natural state. Standards are needed to provide the legal framework for preserving the waters from pollution flowing into the Park from sources located outside the Park boundaries. The basic policy of the standards should be non-degradation.

3. Coordinated comprehensive regional planning should be carried out to minimize the environmental impact of visitor use on the Park and surrounding public and private lands.

4. No additional developments of visitor facilities should be made without a detailed assessment of the potential impact on the natural environment of the Park.

5. Project planning should be finalized and construction initiated at an early date in order to implement the wastewater treatment facilities improvement program outlined for the Park.

6. Wastewater treatment works should have backup systems to minimize interruptions in operation due to mechanical and electrical system malfunctions. Adequate supplies of spare parts should be maintained for electrical and mechanical equipment.

7. Increased emphasis should be placed on operation and maintenance of the wastewater treatment facilities. Additional qualified personnel should be provided to achieve active supervision of the treatment works. Operating personnel should be trained in the basic fundamentals of wastewater treatment.

8. Elimination of the direct discharges to Yellowstone Lake should be expedited. Results of the monitoring program should be evaluated periodically to determine the effectiveness of evaporation-percolation lagoons. If the lagoons are ineffective then other alternatives for disposal should be evaluated, e.g., spray irrigation or tertiary treatment of effluent.

9. A policy of water conservation should be adopted to reduce to a minimum the quantity of wastewater to be treated and discharged.

10. Routine activities in the Park which can cause damage or disrupt the natural environment such as road maintenance, fueling of motorboats, and disposal of boat wastes should receive critical review by the Park Service.

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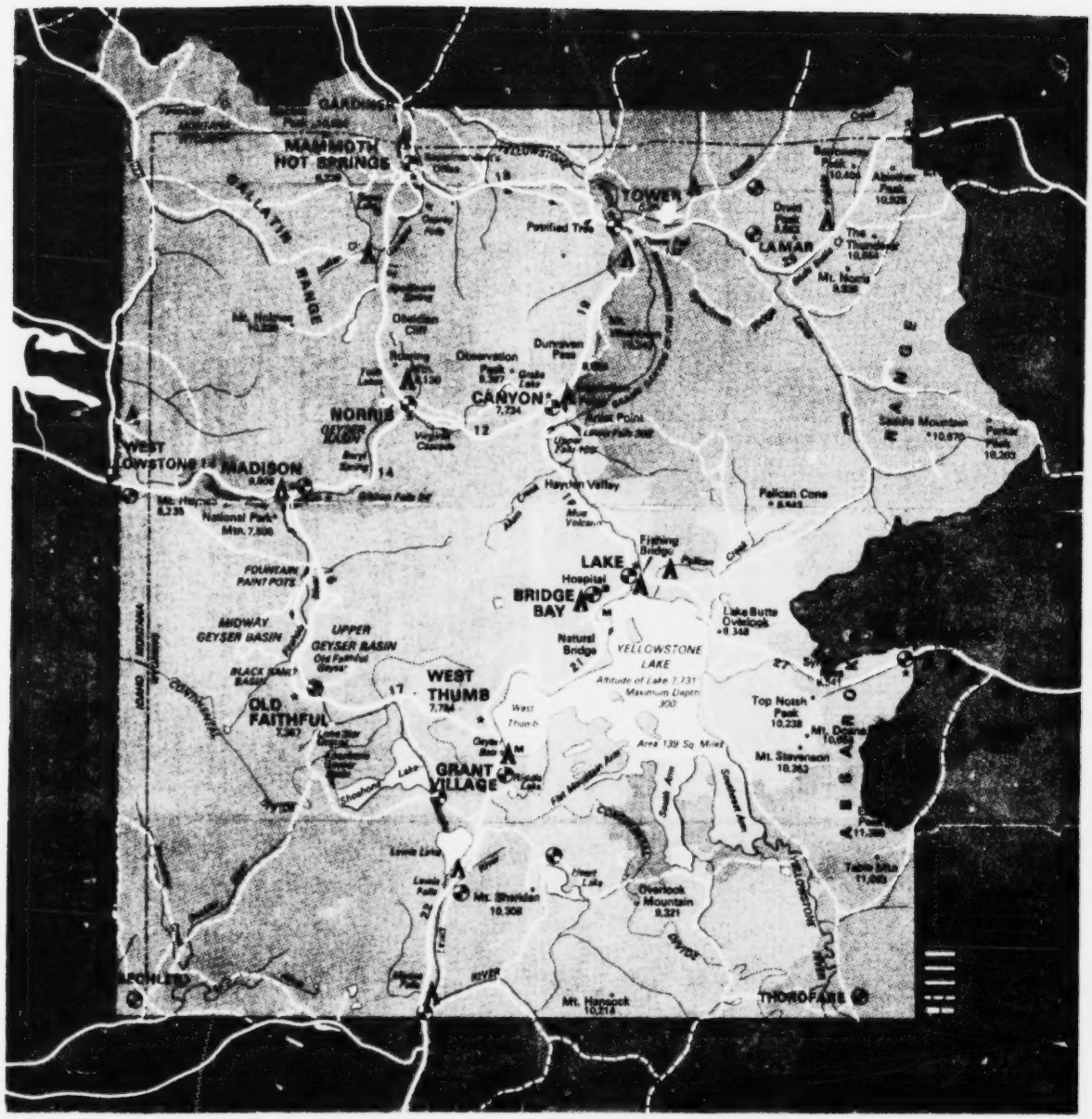

GARDINER
MAMMOTH HOT SPRINGS
GALLATIN RANGE
TOWER
Petrified Tree
LAMAR
Mt. Norris
Dunraven Pass
Observation Peak
CANYON
NORRIS
WEST YELLOWSTONE
MADISON
National Park Mtn.
Hayden Valley
Pelican Cone
Fishing Bridge
LAKE
Hospital
BRIDGE BAY
Lake Butte Overlook
FOUNTAIN PAINT POTS
MIDWAY GEYSER BASIN
UPPER GEYSER BASIN
Natural Bridge
YELLOWSTONE LAKE
Altitude of Lake 7,731
Maximum Depth 300
WEST THUMB
OLD FAITHFUL
Top Notch Peak
Mt. Stevenson
Area 139 Sq. Miles
GRANT VILLAGE
Mt. Sheridan
Overlook Mountain
Mt. Hancock
THOROFARE
ABSAROKA RANGE

XV

DESCRIPTION OF AREA

PHYSICAL

The world's first national park, Yellowstone, is a wonderland of geysers, hot springs, mud volcanos, canyons, and a wildlife display unsurpassed in the United States. The Park was established on March 1, 1872, and now contains about 3,400 square miles in the northwest corner of Wyoming, overlapping into Montana on the north and west, and Idaho, on the west and south.

The Park is characterized by several broad, forested volcanic plateaus. Elevations range from 5,000 feet near Gardiner to 11,358 feet at Eagle Peak in the southeastern corner. The plateaus of Yellowstone, as are seen today, were formed from great flows of lava that spread outward to the foothills of the surrounding mountain ranges, and then accumulated to depths of nearly 6,000 feet. The area is undulating and broken by abrupt escarpments and long table-like ridges of steeply inclined rocks. Deep canyons and gorges also cut the plateau and penetrate nearly to the base of the accumulated lavas. The foothills, contrasting with the plateaus, provide a more broken character with inter-mountain valleys becoming deeper and gradually growing rougher until the higher summit of the ranges present an array of crags and precipices reaching 2,000 to 4,000 feet above the enclosed tableland.

The Park is bordered on the north by mountains of the Beartooth Range, to the east by the Absaroka Range, to the south by the high rolling foothills of the Wind River Range, to the southwest by the Teton Range, and to the northwest by the Gallatin Range. The Continental Divide traverses the region in a southeasterly to northwesterly line beginning near the headwaters of the Yellowstone River and running to the west boundary of the Park at the Montana-Idaho State line.

About eighty-two percent of the Park is forested, ten percent grassland and eight percent nonvegetated. Nearly all trees are conifer with about seventy-five percent being lodgepole pine.

Visitors number over 2 million annually. Most of the visitations occur between May 15 and September 15. Visitor accommodation facilities have been developed at Bridge Bay, Canyon Village, Fishing Bridge, Grant Village, Lake,Madison Junction, Mammoth Hot Springs, Norris Junction, Old Faithful, Tower Falls, and West Thumb.

CLIMATE

Weather extremes in Yellowstone have ranged from a recorded high of 98 degrees to a low of 66 degrees below zero. Summer temperatures generally range from 50 degrees at night into the 70's in the daytime. However, freezing temperatures have been recorded at all stations during all months of the year. Precipitation averages about 25 inches per year, mostly in the form of snow. Snowfall varies with the elevation, those areas along the Continental Divide and on the Absaroka Range along the East boundary getting 200 to 400 inches, and the Mammoth area at 6,000 feet receiving only about 90 inches. Climate in the park area, especially at the higher elevations would be "moderate subpolar," according to the system of Koeppe.1/

During the 1970 survey period the existing conditions closely approximated the climatic average. Details of the temperature and precipitation during the 1970 survey period are shown in Table 1.

HYDROLOGY

Much of the headwaters areas of the Snake and Missouri River systems lie within the boundaries of Yellowstone Park. In an average year nearly 3 3/4 million acre-feet of water leave the Park boundaries in the surface streams. Of this 3 3/4 million acre-feet, 2.2 million flow in the Yellowstone River, 0.6 million in the Snake River and 0.9 million in the Madison-Gallatin River systems to the Missouri River. Most of the smaller streams in the Park originate from snowmelt entirely and hence freeze completely during the winter months. Typical average annual hydrographs for selected streams in the basin are shown as Figures 1, 2, and 3.

During the course of the survey the average monthly flows at the flow measurement stations ranged from 100.7 percent to 146.6 percent of the long-term average monthly flows. However, this departure from normal is not considered to be excessive and the data, as gathered during the 1970 survey,should be characteristic for all streams within the Park. Daily flow levels for typical stations, Madison River at West Yellowstone and Yellowstone River at Corwin Springs, for the period of the survey are plotted on the following pages (Figures 4 and 5). These flows indicate a slow gradual thaw already in progress on May 1 and continuing until after the 20th of May when rising temperatures caused melting rates to increase. During the last week of May, when a set of general chemical samples were collected, the Madison River was in flood stage in the Park. At this time all other streams appeared to also be experiencing maximum runoff levels.

TABLE 1

SUMMARY OF CLIMATIC CONDITIONS - DURING 1970 WATER QUALITY INVESTIGATION

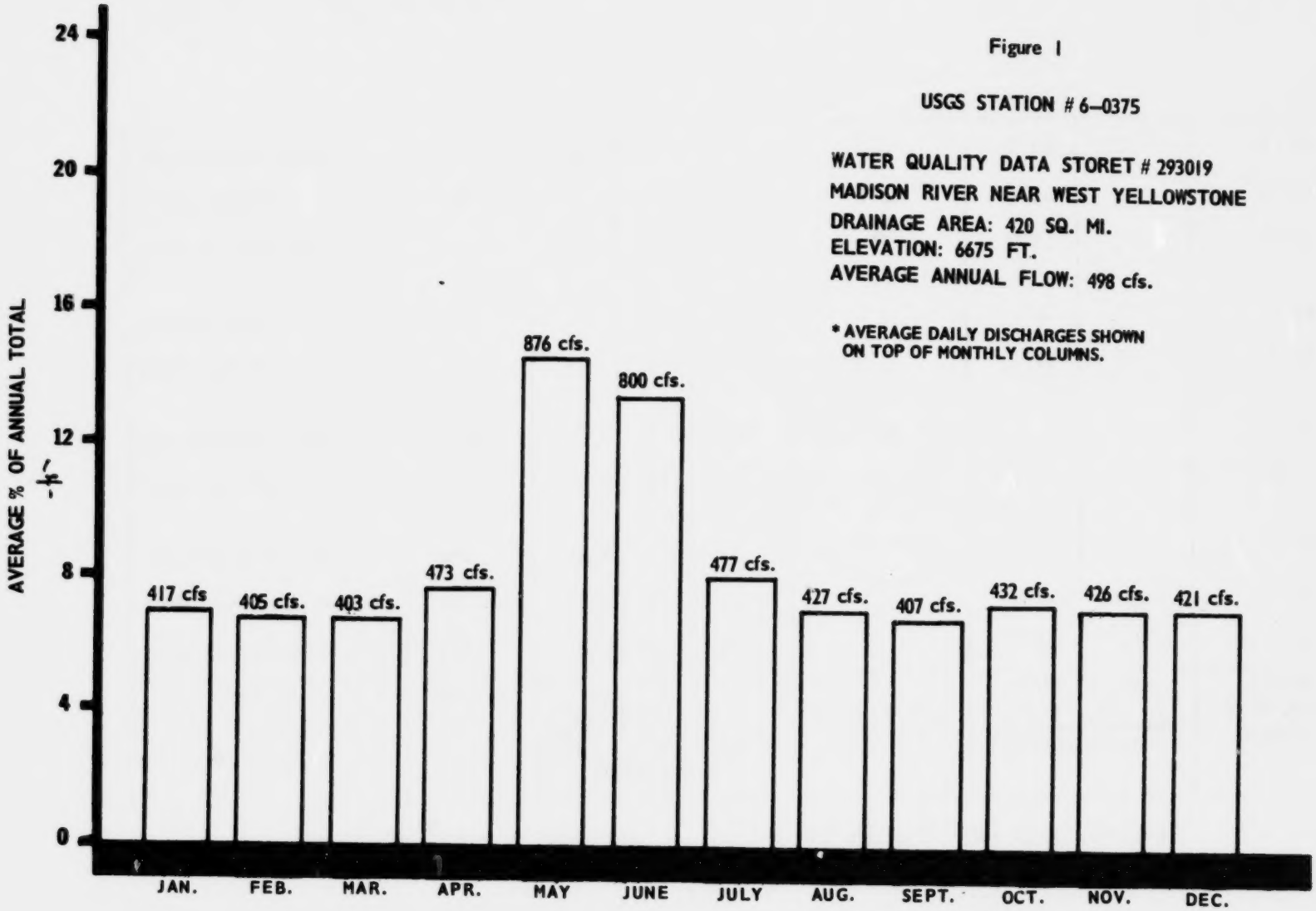
Station	Month	Temperature			Departure From Normal °C	Precipitation		Departure From Normal Inches
		Max. Avg. °C	Min. Avg. °C	Avg. °C		Total Inches	No. Of Days	
Lake Yellowstone	May	12.2	-4.8	3.2		1.92	7	.28
Lamar Ranger Station	May	13.1	-4.3	4.5	-2.8	2.05	7	.54
Yellowstone Park	May	16.0	1.5			1.87	6	0.10
Lamar Ranger Station	June	20.8	0.7	8.8	-0.1	1.42	6	-0.69
Yellowstone Park	June	22.5	6.3	14.4	2.1	1.94	7	-0.30
Lamar Ranger Station	July	25.2	1.9	13.6	-0.9	1.45	5	0.19
Yellowstone Park	July	26.7	9.6	18.1	1.2	1.49	5	0.34
Lake Yellowstone	August	23.7	3.7	13.8		0.97	4	-0.41
Lamar Ranger Station	August	27.6	0.0	13.8	0.4	1.20	4	-0.09
Yellowstone Park	August	28.7	8.9	18.8	2.9	0.69	3	-0.54

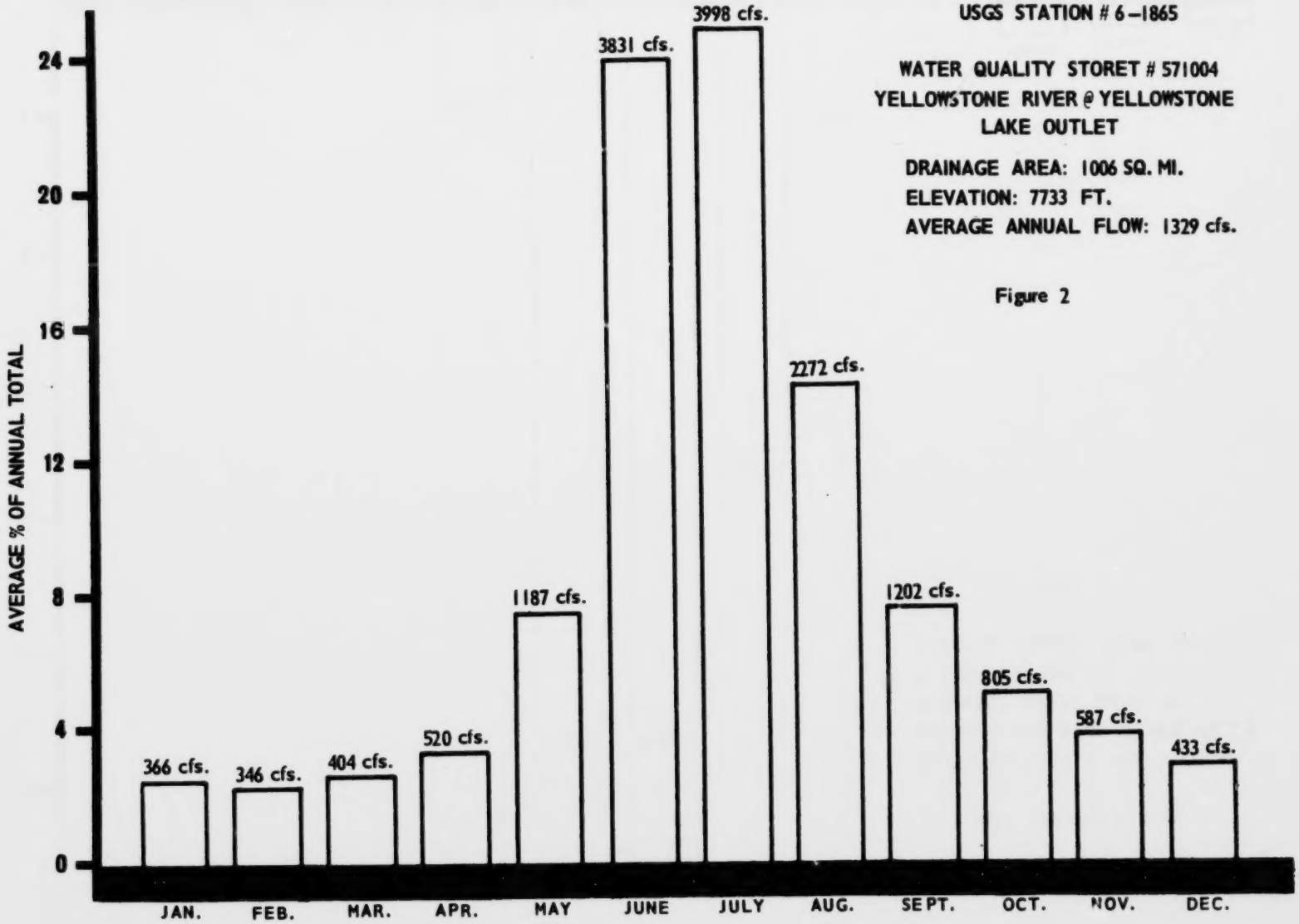
Figure 1

USGS STATION # 6–0375

WATER QUALITY DATA STORET # 293019
MADISON RIVER NEAR WEST YELLOWSTONE
DRAINAGE AREA: 420 SQ. MI.
ELEVATION: 6675 FT.
AVERAGE ANNUAL FLOW: 498 cfs.

* AVERAGE DAILY DISCHARGES SHOWN ON TOP OF MONTHLY COLUMNS.



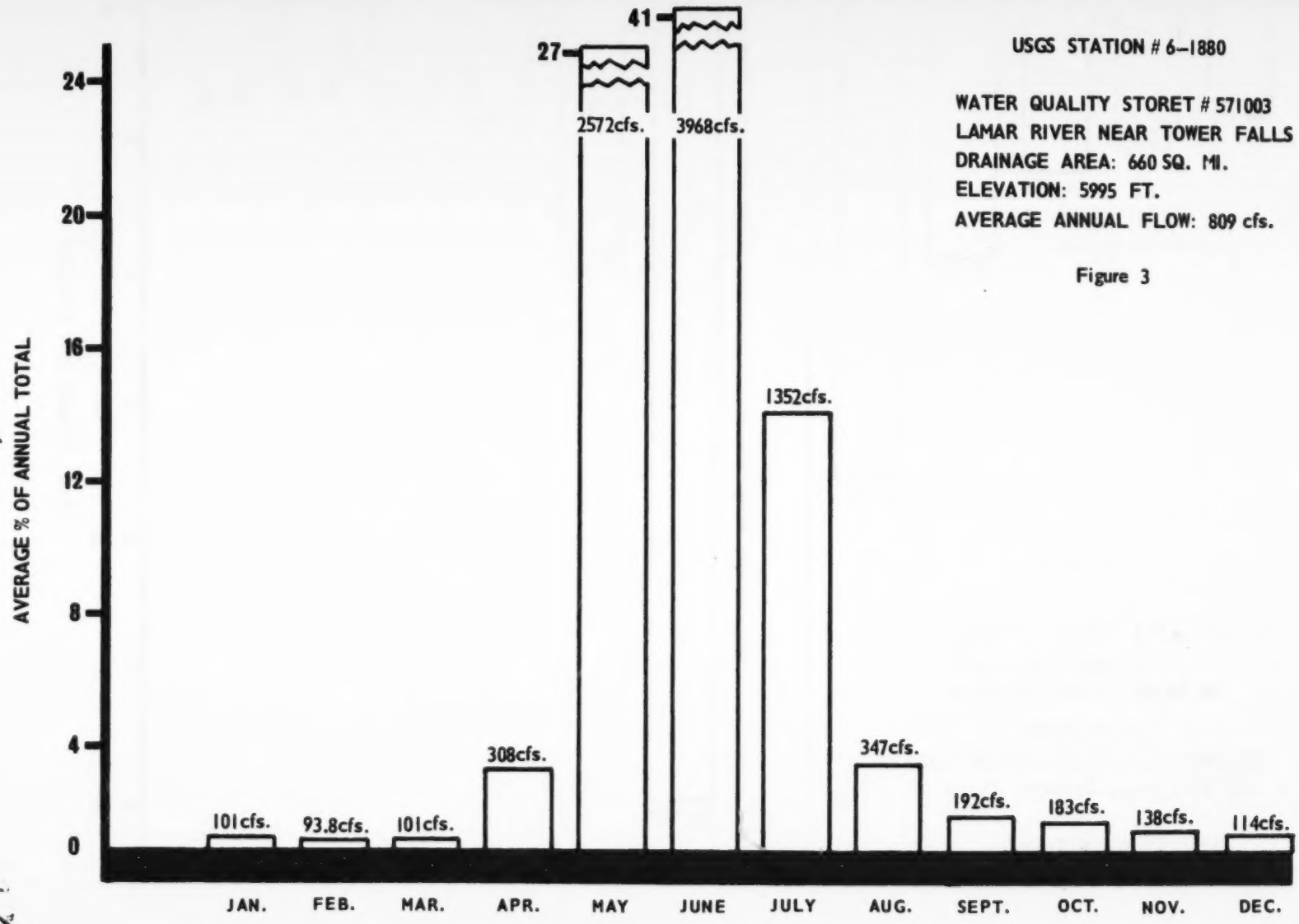


USGS STATION # 6-1865

WATER QUALITY STORET # 571004
YELLOWSTONE RIVER @ YELLOWSTONE
LAKE OUTLET

DRAINAGE AREA: 1006 SQ. MI.
ELEVATION: 7733 FT.
AVERAGE ANNUAL FLOW: 1329 cfs.

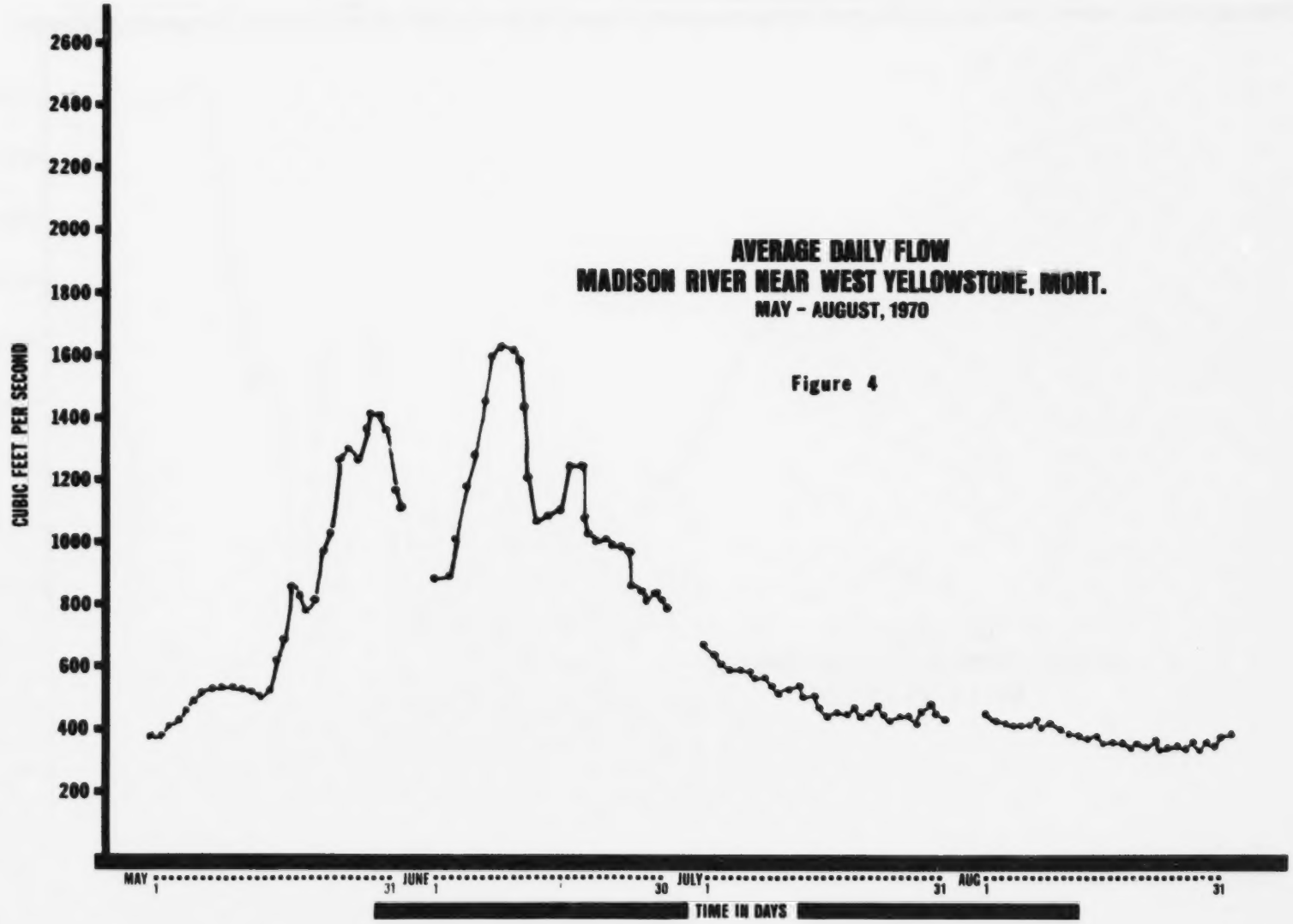
Figure 2

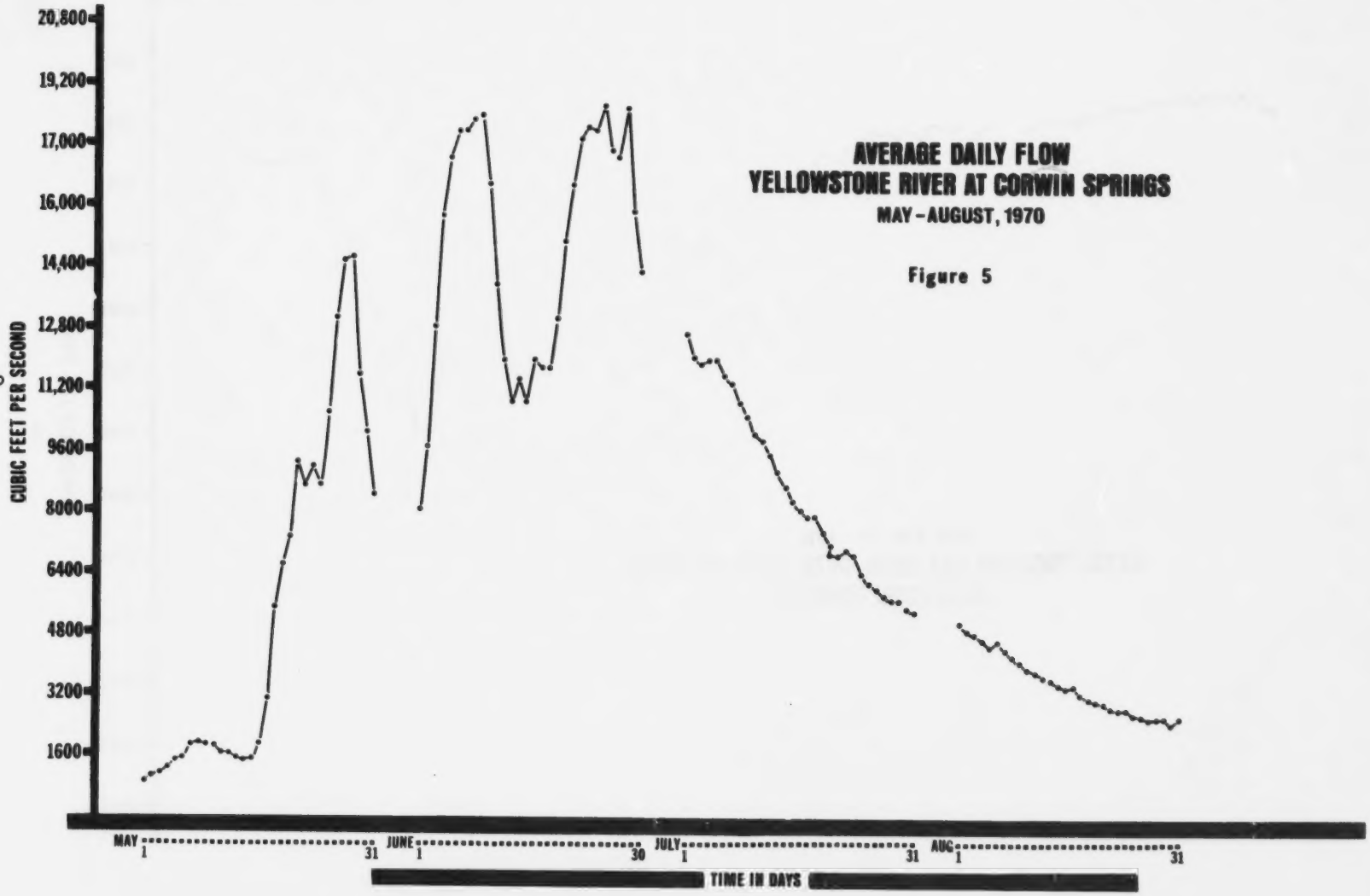


USGS STATION # 6–1880

WATER QUALITY STORET # 571003
LAMAR RIVER NEAR TOWER FALLS
DRAINAGE AREA: 660 SQ. MI.
ELEVATION: 5995 FT.
AVERAGE ANNUAL FLOW: 809 cfs.

Figure 3


AVERAGE DAILY FLOW
MADISON RIVER NEAR WEST YELLOWSTONE, MONT.
MAY - AUGUST, 1970
Figure 4
CUBIC FEET PER SECOND
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
MAY 1
31
JUNE 1
30
JULY 1
31
AUG 1
31
TIME IN DAYS



AVERAGE DAILY FLOW
YELLOWSTONE RIVER AT CORWIN SPRINGS
MAY – AUGUST, 1970

Figure 5

During the latter portion of the survey in July and August, flows were uniform and within twenty percent of the long-term average for that time of the year.

Data from the following flow measurement stations operated by the U.S. Geological Survey are of value in evaluating surface waters in the Park area:

USGS STATION NUMBER	LOCATION
6-0375	Madison River near West Yellowstone
6-0435	Gallatin River near Gallatin Gateway
6-1865	Yellowstone Lake at Yellowstone Lake Outlet
6-1870	Yellowstone River near Canyon Hotel
6-1880	Lamar River near Tower Falls Ranger Station
6-1910	Gardner River near Mammoth Hot Springs
6-1915	Yellowstone River at Corwin Springs, Montana
13-0475	Falls River near Squirrel, Idaho
13-0460	Henry's Fork near Ashton, Idaho

Yellowstone Lake, Shoshone Lake, Lewis Lake and Heart Lake are the largest of the numerous lakes and ponds found in the Park. Yellowstone Lake, with a surface area of 139 square miles at an altitude of 7,730 feet, is the largest body of water at such an altitude in the North American Continent. The maximum depth of Yellowstone Lake is 300 feet.

Nowhere else in the world is there such a concentration of geyser phenomena as is found in Yellowstone Park where there are more than 10,000 thermal features. The geysers, hot springs, fumaroles, pots, and terraces are the most extensive and spectacular in the world.

DISCUSSION OF RESULTS

The quality characteristics of the waters within Yellowstone National Park are unique due to the naturally occurring geothermal phenomena of the region. The unique chemical and physical characteristics of the waters along

with the unique biological communities of the Park set the waters of the Park apart from other waters in the world. The mandate expressed by Congress in the establishment of Yellowstone Park requires that the natural resources of the Park be preserved in their natural condition. An evaluation of water quality must take into account the uniqueness of the water resources and the charge to preserve the water quality in its natural state.

Generally speaking, water quality in the study area is excellent. No areas of major man-caused water quality degradation can be identified, except in the headwaters of Soda Butte Creek where the effects of past mining activity has resulted in excessive discharge of sediment and toxic metals. The fact that no major degradation was noted, however, does not mean that incremental changes too small to be measured are not taking place, especially in waters receiving discharges from waste water treatment plants. Additionally, water quality data collected to date are not adequate to fully describe the complex variations in the aquatic environment.

Due to a lack of long-term data it is difficult to evaluate quality in terms of degradation from historical conditions. In the absence of adequate historical data and the lack of established criteria for measuring the quality of the Park's water, other commonly used criteria have been used for water quality evaluation. It is important to note, however, that most water quality criteria are based on the beneficial use concept, i.e., standards of quality are designed to protect designated beneficial uses. While the beneficial use concept may apply in some cases in the Park, an overriding consideration in the evaluation of the waters of Yellowstone is the responsibility to preserve the unique characteristics of the waters.

In order to provide the framework for evaluating man's impact on the aquatic environment of Yellowstone, additional studies should be pursued to determine the natural condition of the Park's water. To assure that a policy of non-degradation is adhered to, Water Quality Standards should be established for the Park in accordance with the Federal Water Pollution Control Act, as amended, and Executive Order #11507, entitled, "Prevention, Control, and Abatement of Air and Water Pollution at Federal Facilities."

METHODOLOGY

Sampling and analytical procedures for the data presented in this report are in accordance with procedures outlined in

"Standard Methods" 2/ or "Federal Water Pollution Control Administration Methods for Chemical Analysis." 3/ All stream and lake samples were grab samples. Effluent samples from the various waste treatment plants were composited in order to overcome variations that occur during each day.

Each of the various water quality parameters for which samples were analyzed during the survey is discussed below. A description of the significance of the parameters to the over-all water quality levels of occurence and possible causes or explanations for unusual levels are offered.

To place some of the analytical levels in perspective with other waters, Table 2 was constructed to show the average level of selected parameters at various comparable areas in the Missouri River System and in Lake Tahoe, California.

PHYSICAL TESTS

Specific Conductance

Specific conductance is the ability of a substance to conduct an electrical current. The determination of conductivity is a quick method for estimating the ion concentration of water. Conductivity of rain and snow melt waters range from 5 to 10 umhos/cm. Surface waters generally have a lower level of conductance than groundwaters, due primarily to less contact with soluble portions of the soil and rock. Most of the streams within the Park originate from snowmelt which is relatively low in dissolved minerals. Geyser waters are extremely rich in dissolved minerals. The varied inflows from the hot underground water sources create considerable differences in stream water quality as the streams flow through the geyser areas. 4/

In the Yellowstone Park surface waters, the conductivity values are all less than 450 umhos/cm or about ½ the average level of waters in the Missouri River at Kansas City. Most small streams originating from snow melt have values of less than 100 umhos/cm. The waters of all major lakes, including Yellowstone Lake, have levels of 75 to 125 umhos/cm. Duck Lake, used as a water supply for the West Thumb area, had a conductivity of less than 25 umhos/cm and was the lowest level recorded at any of the locations sampled.

In those areas where the contribution of subsurface water from springs and geysers was significant, the conductivity values were routinely higher. Maximum levels were recorded on the Gardner River below Mammoth Hot Springs (Avg. 426 umhos/cm) and on the Firehole River near its mouth (Avg. 387 umhos/cm).

TABLE 2

COMPARATIVE WATER QUALITY CHARACTERISTICS

Station	Drainage Area Sq. Mi.	Average Flow cfs	Specific Conductance micromhos/cm	Hardness as mg/l $CaCO_3$	Chloride mg/l Cl	TOC mg/l C	Total NH_3 + ORGN mg/l N	Total PHOS-P mg/l P	BOD_5 mg/l
Snow and Rain Selected Locations United States			5.3		0.50		0.43*	0.05	
Lake Tahoe, California[11/]	506	198	88		1.7		<0.005	0.009	
Duck Lake Near West Thumb, Wyoming		Closed	20	5.8	1.6	2.4	0.19	0.04	1.26
Yellowstone River At Lake Outlet	1,006	1,288	88	18.7	5.2	2.9	0.13	0.05	0.94
Madison River At West Entrance	420	473	340	7.0	41.8	6.8	0.28	0.11	1.37
Yellowstone River At Sidney, Montana	68,812	12,880	624	210	20.8	8.14	1.48	0.17	--
Missouri River At Williston, North Dakota	164,500	21,960	661	226	10.9	5.04	0.93	0.07	1.58
Missouri River At Gavins Point, South Dakota	279,500	24,370	765	236	17.1	4.63	0.92	0.04	1.55
Missouri River At Kansas City, Missouri	322,800	27,680	721	233	17.9	10.56	2.57	0.24	2.96
Missouri River at Hermann, Missouri	528,200	79,050	454	206	22.7	11.03	3.32	0.32	2.53

* Ammonia Only

In the upper reaches of Soda Butte Creek on the northeast corner of the Park, there has been extensive mining for metal ores. This problem area is discussed in greater detail in a separate report 22/ but the occurrence of high conductivity levels in this area would appear to be related at least partially, to leaching of the tailings piles from the old mine workings.

Hydrogen-ion Concentration

The symbol "pH" represents the base 10 logarithm of the reciprocal of the hydrogen ion concentration. In a practical way, the "pH" is a measure of the over-all balance of the series of equilibria existing in solution. Inasmuch as excessive concentrations of specific ions frequently overbalance the equilibrium in one direction or the other, the pH is an indicator of pollution problems. Guidelines for evaluating pH levels are 5/:

TABLE 3

Limiting pH Values		Remarks
Minimum	Maximum	
6.0	7.2	Optimum range for fish eggs.
6.5	8.4	Range tolerated by most freshwater fish.
7.5	8.4	Good range for plankton production.

Measured levels of pH recorded in park waters ranged from 5.4 to 9.2, well beyond both ends of recommended scales. The major portion of the surface waters sampled had pH levels between 7.3 and 7.6. In waters of low mineral content such as were encountered in the Park, the existing equilibrium is easily destroyed by small additions of strongly dissociating compounds. Low pH levels were recorded in samples taken in areas of sulfurous hot spring contributions to natural surface waters. In Mary Bay, where the 5.4 level was recorded, the situation is clearly of a transient nature as hydrogen sulfide gas is continually being given off in this area to the atmosphere and the amount of this gas absorbed by the water is rapidly converted to weak sulfurous acid. The high pH levels recorded, 9.2 on the Firehole River, also appear to be a transient condition related to the groundwater contributions from the springs and geysers in this area. These groundwater contributions were stable at the high temperature and pressure existing in the underground environment and are subject to rapid geochemical changes on exposure to atmospheric pressure

and temperatures. Evidence of the rapid geochemical changes in these waters is provided by the spectacular mineral deposits around the more active springs and geysers. Normal levels of pH are generally achieved in all areas except those close to geyser activity.

Turbidity

Turbidity is a measure of the extent to which the intensity of light passing through a sample is reduced by suspended and colloidal matter. This suspended and colloidal matter is generally a combination of natural silt and clay particles, microorganisms or organic debris or mineral substances precipitating as a result of changes of chemical equilibrium in the water.

The USPHS 1962 Drinking Water Standards 6/ specify that turbidity in finished waters for domestic consumption should not exceed 5 Jackson Turbidity Units (JTU). A survey of the literature indicates that with respect to direct lethal effects turbidities as high as 200 JTU are harmless to fish. Using this level as some guide to significant turbidity levels it would be safe to say that observed levels in Park waters were generally negligible. Within the major lakes of the Park the average level from four or more samples was generally less than 1.5 JTU and in several areas averages were less than 0.5 JTU. Natural increases in stream turbidities due to runoff associated with the spring thaw caused the levels observed in streams to be somewhat higher at that time but still less than 10 JTU and in most cases less than 5 JTU. The maximum single observed turbidity was 110 JTU on the Lamar River following a rainstorm above this station. The average levels and ranges observed on the major streams leaving the Park are as follows:

TABLE 4

TURBIDITY LEVELS

JACKSON TURBIDITY UNITS

Location	Max.	Min.
Snake River at South Entrance (5711998)	65	0.5
Madison River at West Entrance (293019)	3.8	0.6
Yellowstone River Below Gardiner (293014)	17	0.9
Gallatin River at Weat Park Boundary (293018)	9.0	0.6

Temperature

Temperature levels in Park waters result from natural climatic phenomena and from the addition of natural thermal waters from underground sources. Because of the importance in relation to suitability of waters as a habitat for aquatic life, temperature is a frequently measured parameter.

In relation to trout which are one of the significant end products of the aquatic life chain in the Park waters the literature contains the following references. 5 & 7 /

1. Median high temperature (TLM time not specified) tolerance limit for adult lake trout is reported as 23.5°C with optimum temperature for growth and reproduction given as 13°C.

2. For spawning and hatching of eggs for trout, a maximum level of 14.4°C is reported.

Waters at the surface in the major part of Yellowstone Lake achieved a maximum temperature at nearly all stations of 13.5°C during July. This temperature is almost identical with the optimum range for lake trout growth and production. Surface temperatures on the smaller streams which receive snowmelt all year long generally ranged from supercooled flows in early May to a maximum of 10°C (10°C = 50°F) or less in July. On the larger streams, the annual fluctuation was somewhat greater with summer maximum temperatures approaching 20°C (20°C = 68°F). In the Madison River and its tributaries, the presence of significant additions of thermal water maintain the winter minimum temperatures between 5 and 10°C and summer maximums of near 20°C.

Radioactivity Investigations

As part of the collection effort, samples for radiological analyses were collected at selected sites in early May and late July and analyses are found in Table 5.

All of the analyses for radioactivity refer to materials in the dissolved state after filtration through a membrane filter. Individual results, as listed in Table 5, show concentration at low natural levels at all stations.

CHEMICAL TESTS

Oxygen

Dissolved oxygen levels in water receive attention because of their relationship to the ability of the water to support

TABLE 5

RADIOACTIVITY LEVELS

STORET Number	Station Location	Date	Tritium pCi/l	Radium 226 pCi/l	Uranium µg/l
293015	Yellowstone River at Gardiner	5/07/70		0.03	0.3
		7/22/70	961 ± 157	0.10	0.1
571001	Lamar River near Tower Falls	5/09/70		<0.01	0.3
		7/22/70	946 ± 157	<0.05	0.1
571004	Yellowstone River at Fishing Bridge	5/07/70		<0.01	<0.1
		7/19/70	940 ± 157	<0.05	<0.1
169998	Falls River at Cave Falls	6/17/70	380 ± 150	0.06	0.3
571998	Snake River at South Park Boundary	5/08/70		0.09	0.2
		7/20/70	633 ± 153	0.14	0.1
571996	Lewis River at Lewis Lake Outlet	5/08/70		<0.01	0.4
		7/20/70	672 ± 153	0.08	<0.1
293018	Gallatin River below Specimen Creek	5/08/70		0.05	0.1
		7/17/70	<378	0.11	0.2
293019	Madison River near West Entrance	5/08/70		<0.01	0.3
		7/21/70	616 ± 153	0.09	0.5
571037	Gibbon River near Mouth	5/08/70		<0.01	0.8
		7/21/70	<378	0.05	0.8
571043	Sylvan Lake	5/07/70		<0.01	<0.1
		7/19/70	802 ± 156	0.11	<0.1
571044	Middle Creek near East Entrance	5/07/70		<0.01	2.6
		7/19/70	548 ± 152	0.05	<0.1

aquatic life and their importance as indicators of the general nature of the equilibrium being established between oxygen being supplied and that used in the decomposition of organic matter.

Oxygen saturation levels in water are related to temperature and salinity of the water and the partial pressure of oxygen in the atmosphere at the surface of the water body. Because of the changes in elevation in the Park, the table below gives saturation values of oxygen for two temperatures for the range of elevation occurring in the Park.

TABLE 6

OXYGEN SATURATION VALUES

mg/l

Elevation Ft. Above Sea Level	Water Temperature °C	
	10°	20°
6240	8.65	7.02
6560	8.51	6.91
6900	8.38	6.81
7200	8.32	6.75
7550	8.20	6.65
7880	8.13	6.60

Most dissolved oxygen levels measured near the surface, especially of the turbulent flowing streams, were at or above saturation values. Small depressions were noted only in those areas of a swampy nature where biological decomposition is expected to be greater. In Pelican Creek and the Yellowstone

River upstream of the Lake, average D.O. levels were depressed below saturation but above 7.0 mg/l.

There is no general statement which can be made to give the minimum dissolved oxygen concentration required to support fish life. This is owing to the fact that the oxygen requirements of fish vary with species, age, prior acclimatization, temperature of the water and a complex of other factors. Since many species probably require full air saturation for their full scope of activity [8] it would be unrealistic in the National Park waters to specify an acceptable minimum standard for these waters which allowed degradation from the natural state. In regard to water quality standards, various investigators recommend minimum levels of 6.0 mg/l for sixteen hours of any 24 hour period for waters used for multiple purposes.

Samples were collected at various depths off Stevenson Island in Yellowstone Lake in the early afternoon of August 4th. The results are presented in table 7. Concentrations of Dissolved Oxygen increase nearly 1 mg/l from top to bottom while temperature of the water falls some 8.5°C. Conditions at the surface are slightly supersaturated, as would be expected on a warm sunny summer afternoon even in an oligotrophic lake. At the bottom, although the concentrations are higher, the percent saturation is 70 to 75 percent.

TABLE 7

DISSOLVED OXYGEN

YELLOWSTONE LAKE NEAR STEVENSON ISLAND

ELEVATION 7,792

August 4, 1970 at 1300 to 1400 Local Time

Depth Below Surface Ft.	Temperature °C	Dissolved Oxygen mg/l	Dissolved Oxygen % Saturation
1	15	7.80	108
50	14	7.90	106
100	6.5	8.65	72.6
110 (Bottom)	6.5	8.70	73.1

Alkalinity

Alkalinity is a measure of the ability of the solution to neutralize hydrogen ions and not a specific polluting substance. In common with the pH and conductivity, the alkalinity is used to evaluate the natural quality and to understand natural conditions well enough to forecast the effects of added pollutants. In a general way, alkalinity could be expressed as a buffer capacity or an ability to resist sudden changes from the natural pH levels. It is generally recognized that the best waters for the support of a diversified freshwater aquatic life are those with pH values between 7 and 8 and total alkalinity levels of 100 to 120 mg/1.[5]

Only the waters of the Gardner River below Mammoth had an average alkalinity of 120 mg/1. At this location the range of values was 146 mg/1 to 92 mg/1. These higher levels are due to the thermal discharges in the Mammoth area. Higher than average levels in the Madison River drainage can also be attributed to thermal water contributions. In this area, the average levels ranged close to 100 mg/1. Throughout the Yellowstone drainage and the smaller streams of the Park, average levels were generally between 20 and 40 mg/1 indicating a relatively dilute and unbuffered water. In the Yellowstone drainage, slightly higher levels were encountered where waters were more stagnant, as in Pelican Creek, and in the waters draining the northeast corner of the Park where different geological formations may be responsible for a different mineral content in the water.

It is interesting to note that from the limited data it would appear the percentage of water which freezes each year in the smaller closed lakes is sufficient to cause a significant increase in the alkalinity of the remaining water. In both Duck Lake and Sylvan Lake, the alkalinities under ice cover were relatively high. As soon as the ice melted in the spring, a low alkalinity resulted and by July the lakes had levels close to their annual average. Because of the depth of Yellowstone Lake, this effect was not observed there. The table below summarizes the variation of alkalinity with season in the Park.

TABLE 8

	Alkalinity Levels mg/1			
Location	Under Heavy Ice & Snow	Early Summer	Lake Summer	Yearly Average
Duck Lake	18	4	8	8.9
Sylvan Lake	38	9.9	29	26.7
Yellowstone at Fishing Bridge	36	22	30	28.8

Biochemical Oxygen Demand

Biochemical Oxygen Demand tests measure the amount of oxygen required to remove organic matter from the waters in the process of decomposition by aerobic bacteria. In areas of population concentration and industrial development, BOD levels are frequently used as a guide to effluent standards in order to protect waters from organic pollution. Levels of BOD which could cause harmful effects vary widely with the characteristics of a water body. In a slow, warm, sluggish stream or lake, a five-day BOD of 5 mg/l might be sufficient to produce deoxygenation resulting in anaerobic conditions. A swift cold mountain stream, on the other hand, can easily handle 50 mg/l without appreciable reduction of dissolved oxygen levels.

BOD levels throughout Park waters were very low and indicative of only natural levels of organic matter being discharged to Park waters. Average concentrations generally ranged from less than 1 mg/l in the smaller headwater streams to near 2 mg/l in the major streams leaving the Park. The highest level observed was a single sample with 2.7 mg/l taken under ice on Yellowstone Lake at the entrance to West Thumb.

Detergents (MBAS)

Because of the lack of a natural source, it was felt that detergent levels in Park waters would be a good chemical test to evaluate levels of contamination by human use of the Park. One mg/l of the surfactant component has been known to cause frothing of some water supplies. Work in regard to lethal effects of surfactant on aquatic life is somewhat incomplete due to the variety of compounds used in the surface active portion of the detergent. Generally levels less than 5.0 mg/l were not observed to have any toxic effects.

MBAS levels were analyzed for at only a few downstream locations in the Park and below Cooke City on Soda Butte Creek. The maximum level observed from fifteen analyses was 0.06 mg/l. Although the detection limit is 0.01 mg/l, no surfactant was detected in more than one-half of the samples

Hardness

Although the composition is difficult to define, the analysis of hardness in water has been universal in past studies of water quality. Over the years the property of hardness has generally been associated with the effects observed in the use of soap and with the incrustations left by some types of water when it is heated.

Most of the effect observed with soap and incrustations results from the presence of calcium, magnesium, and other cations. The accurate method for determining hardness is to compute it from the results of the specific cation analyses. Since this is a computed rather than an analytically determined number, it is not reported in the data contained in the Appendix. Trial computations were carried out for several stations, as listed below and on Table 2.

TABLE 9

Location	Hardness (mg/l as $CaCO_3$)
Yellowstone River at Lake Outlet	18.7
Duck Lake	5.8
Madison River at West Entrance	7.0

The levels observed in the Park waters are very low.

Phenolic Compounds

Analysis of Park waters for phenolic type compounds was done primarily to provide current and future investigators with a precise idea of current concentrations. As measured by current analytical techniques, the phenolic-type compounds can come from either industrial or natural sources. Previous investigators have shown that the natural decomposition of organic debris, particularly under anaerobic conditions, results in the production of phenolic-type compounds.5/ The significance of phenols is primarily related to their ability to cause taste and odor problems in water supplies at concentrations of 10 ug/l or less, especially when such waters are subjected to chlorination which enhances the odor producing ability. Fifteen samples were analyzed for phenolics with a maximum observed level of 4.9 ug/l on the Yellowstone River at Fishing Bridge; other results ranged from 0.6 to 3.5 ug/l. These levels are indicative of not only unpolluted water but also of water relatively uncontaminated from natural sources such as decaying vegetation.

Silica

The natural weathering of rocks is usually the main source of silica in water. Crystalline silica as quartz is a major constituent of many rock types. The common range of silica concentrations in water is from 10 to 60 mg/l. Many sources of groundwater related to part of present volcanic activity have a high concentration of silicates in dissolved or colloidal form. The thermal springs and geysers of Yellowstone Park are

in this category. In the Madison River drainage, silica levels rise from 40 to 50 mg/l near Norris on the Gibbon River and Kepler Cascades on the Firehole River to near 100 mg/l in downstream reaches. In other streams of the Park the silica content ranges from slightly less than 10 mg/l in Yellowstone Lake to around 20 mg/l in the Yellowstone River and tributaries and to near 40 mg/l in the Snake River drainage. Since diatoms are the dominant species in this oligotrophic lake, removal of silica by this route is anticipated. An average silica level of 1.5 mg/l was observed in the small closed basin lake (Duck Lake) which serves as the water supply for the West Thumb area. Silica does not appear to have any effects on humans or aquatic life at the levels observed.

Total Residue

Analyses for either "total" or other solids type determinations are subject to considerable variations. In these gravimetric determinations, a known amount of representative sample is evaporated to dryness at a preselected temperature and the residue is weighed. Small errors in the several weighings involved can make substantial differences in the concentration, especially at the low levels observed in areas of Yellowstone Park. The total residue is defined as the sum of the homogeneous suspended and dissolved materials in a water as present after a 105°C drying period.

In a general way, the total residue, when compared to filterable or dissolved residue, may be used to evaluate the load in the waters under study. In the Park, the total residue average levels are almost uniformly 30 mg/l or less above the filterable levels. The discharge of thermal waters in the Firehole, Gibbon, and Gardner Rivers causes the maximum solids to occur in these areas. Based on only a few samples, it would appear that there is a significant increase in total solids related to disruption of the natural terrain in the vicinity of past mining activity at Jardine and Cooke City. Because of the reduced velocities and long-settling time, total residue in Yellowstone Lake was less than 100 mg/l, and in Duck Lake was 66 mg/l.

Filterable Residue

In natural water, the filterable residue consists mainly of carbonates, bicarbonates, chlorides, sulfates, phosphates and possibly nitrates of calcium and magnesium, sodium and potassium, with traces of iron manganese and other substances. This analysis, therefore, is a general indication of the level of all ions in solution. At all levels the residue in a given stream is related to conductivity. Since conductivity is relatively easy to measure, especially in remote locations,

TABLE 10

CONDUCTANCE VERSUS FILTERABLE RESIDUE AT SELECTED STATIONS

Location		Conductance µmhos/cm	Filterable Solids mg/l	Solids/Cond Ratio
Yellowstone River at Fishing Bridge (571004)		94	72	0.76
		80	59	0.73
		65	57	0.87
		92	79	0.84
		88	108	1.22
	Avg.	-	-	0.89
Firehole River near Mouth (571040)		376	337	0.89
		283	213	0.75
		454	309	0.68
		439	343	0.78
	Avg.	-	-	0.77

construction of conductivity versus stream stage versus solids rating curves for specific sites is fairly common. Table 10 is presented to show the relationships between residue and conductivity for two stations with somewhat different filterable residue levels. These two stations are typical of the stations in the Yellowstone and Madison River drainages. In the Yellowstone area, nearly all filterable residue levels were in the range of 60 to 100 mg/l except the Gardner River below Mammoth, which was 311 mg/l average.

In the Madison River area downstream, average filterable residue levels ranged from 200 to 300 mg/l. The source of this increase is clearly additions of thermal water, as shown by changes in the concentration in the Firehole River as listed below.

TABLE 11

FILTERABLE RESIDUE LEVELS

Location	Filterable Residue* mg/l
Firehole River near Kepler Cascades	86
Firehole River below Little Firehole River	195
Firehole River near Mouth	300

* Samples dried at 180°C

Similar changes are observed in the Gibbon and Gardner Rivers.

At levels recorded in Park waters the filterable residue should not interfere with any beneficial uses. Levels for irrigation and domestic water supply are two or three times the maximum observed in Park waters. 5/

Trace constituents analyses were not performed at all locations. Those substances which were difficult to determine analytically and were not expected to occur at significant levels were determined only at selected stations (Table 12). In general, the same stations were used for each of the trace constituents; these stations are:

TABLE 12

SELECTED STATIONS FOR TRACE ELEMENT ANALYSES

STORET No.	Location
571000	Soda Butte Creek at Northeast Entrance

STORET No.	Location
293014 and 293015	Yellowstone River near Gardiner, Montana
571998	Snake River at South Park Boundary
293018	Gallatin River near West Park Boundary
293019	Madison River near West Entrance

Arsenic

Arsenic is notorious for its toxicity. A considerable proportion is retained at low intake levels. For this reason the 1962 USPHS Drinking Water Standards recommend the concentration of arsenic in drinking water should not exceed 0.01 mg/l and concentrations in excess of 0.05 mg/l are grounds for rejection of the supply. Toxic levels for aquatic life, as reported in the literature, are generally 1 mg/l or more, or 100 times greater than levels significant for human consumption.

All samples collected at the Snake River at South Entrance, the Yellowstone River near Gardiner and especially the Madison River near West Entrance exceeded the recommended levels of 0.01 mg/l. All samples collected from the Madison River near West Entrance exceeded the maximum limit of 0.05 mg/l by a factor of four or five, with the average level at this point being 0.22 mg/l. It is probable that this cation is contributed by the thermal springs in the Old Faithful and Norris areas. Stream concentrations in these areas could easily be double the concentrations observed on the Madison River at West Entrance. Further work is needed to adequately evaluate arsenic in Park waters.

Barium

Barium is not normally present in surface waters. The sulfate and carbonate salt are highly insoluble and consequently any barium ions discharged to natural waters would be quickly precipitated and removed by adsorption and sedimentation. In a few areas of springs in sedimentary rocks or evaporite deposits, barium has been found in measurable concentrations.

Because of a suspected toxic effect on the heart, blood vessels and nerves of humans, the 1962 USPHS Drinking Water Standards have established a limit of 1.0 mg/l for barium. One mg/l is also the detection limit for the normal analytical procedure for this cation. Four replicate samples at each of nearly fifty sites in the Park were tested for barium with no results above the detectable limit.

Boron

The occurrence of boron in nature is generally limited to a few igneous and metamorphic rock types and to some evaporite deposits. Hot springs in volcanic areas are known to contain relatively high concentrations of this element. One analysis 4/ on a spring in the Norris Geyser Basin contained 2.5 mg/l of boron. Boron has been studied extensively in many areas of the Western United States because small amounts of boron in irrigation water and soil are damaging to certain crops. This toxic effect begins at levels as low as 1 mg/l. Levels in Park waters were not observed to be as high as 1.0 mg/l. Only selected stations were analyzed for this constituent; however, and the level in the Madison River at West Entrance (0.51 mg/l) indicates levels in excess of 1 mg/l probably do occur in the Firehole River below the Old Faithful area and perhaps in other streams which receive significant additions of thermal water. Recommended limits of boron in drinking water in the literature are 20 to 30 mg/l. Concentrations at this level were not found to occur in surface waters in Yellowstone Park.

Calcium

Calcium salts and calcium ions are among the most commonly encountered substances in water since it is a major constituent of many rock types, is relatively soluble and is not precipitated from normal streams. Large travertine deposits built around some of the major thermal discharges in the Park are indicative of deposition of calcium carbonate when these thermal waters attempt to reach equilibrium with the atmosphere. In the Gardner River below Mammoth the milky color of the water and the increased turbidities would appear to be calcium carbonate precipitating from the water.

Calcium in excess of the concentration normally found in water is an essential item of human nutrition. Based on a complex of factors, including consumption and other household uses, 75 mg/l of calcium is given as a permissible limit for waters for domestic use by the World Health Organization.

In Park waters, calcium levels are low and in nearly all cases less than 10 mg/l. Levels tend to rise in a downstream direction with headwaters streams generally having concentrations of less than 5 mg/l reflecting more direct run-off from precipitation and less contact with the lithosphere. In Duck Lake the average calcium level was 1.5 mg/l, the lowest level observed in the Park.

The data on each station is limited to four or five analyses and it is, therefore, difficult to draw any definite conclusions concerning trends. It would appear that maximum calcium levels occur during winter periods of minimum flow when

groundwater contributions of more mineralized water to stream flow is at its highest percentage. A very distinct maximum occurs on Soda Butte Creek at Cooke City (293011) where disruption of the natural terrain by mining activity has resulted in considerable more opportunity for water contact with soil and rock. In this location, calcium levels at winter low flows are as high as 130 mg/l, more than four times the summer average of about 30 mg/l, which is still more than double levels in undisturbed neighboring watersheds.

Copper

Copper generally occurs in natural surface waters in trace amounts up to about 50 ug/l. Levels above this can generally be regarded as indicative of pollution. Concern over copper levels in regard to human consumption is related to the taste caused in water by concentrations on the order of 1,000 ug/l. This level has been recommended as a standard in the 1962 USPHS Drinking Water Standards, primarily because of the taste problem. Long before copper levels become of concern to humans they become a significant threat to many types of aquatic life. The toxicity of copper to aquatic organisms varies significantly with species of aquatic life and with physical and chemical characteristics of the water. Copper also exerts synergistic effects, especially in combination with zinc, cadmium, and mercury. Literature reports of toxicity studies involving copper are numerous. A summary of the findings indicates that concentrations varying from 100 to 1,000 ug/l have been found to be not toxic for most fish; whereas, other investigations report concentrations of 15 to 3,000 ug/l are toxic to many kinds of fish, crustacea, mollusks, insects, phytoplankton, and zooplankton.5/

In the waters of the Park, four replicate analyses were performed on samples from fifty locations in the Park. All values with the exception of Soda Butte Creek near Cooke City are less than the detectable limit of 20 ug/l. At Cooke City, below the McLaren Mine tailings pile (293010 and 293011), the results vary widely with two analyses showing concentrations of 600 and 780 ug/l, while in others copper was not detectable.

Iron

Iron is an abundant constituent of rocks and soils. Because of the importance of iron in relation to the usability of waters for domestic and industrial purposes, iron is commonly determined in water analyses. The limits of iron for domestic consumption are not based on physiological considerations but rather on

esthetic and taste considerations, as iron and manganese tend to deposit dark stains on laundry and porcelain fixtures. The 1962 USPHS Drinking Water Standards give 0.3 mg/l soluble iron as a recommended limit for domestic uses.

If iron salts are added to unbuffered water, the pH may be lowered to a toxic level and the deposition of iron hydroxide may have lethal effects on fish and other aquatic life. There are literature reports of death of pike, tench, and trout at pH 5.0 to 6.7 in waters with one to two mg/l of iron.

The current analytical technique in use by the Environmental Protection Agency, Region VII, Laboratory has a detection limit for iron of 10 ug/l. At many stations, especially in the Yellowstone drainage, samples were collected in which iron was not detected. Average concentrations at nearly all locations were less than 0.3 mg/l with exceptions apparently due to natural conditions. These natural conditions were apparent on the Gibbon River below Norris Geyser Basin (571038), on Pelican Creek (571016), and on the Gardner River below Mammoth Hot Springs (571005).

In the area of the McLaren Mine tailings on Soda Butte Creek near Cooke City (293011), iron levels as high as 85 mg/l were observed and heavy deposits of ferric hydroxide are observed on the stream bottom. Above normal iron levels are apparent on Soda Butte Creek inside of the Park (571000 and 571001).

Lead

Lead is not a normal constituent of the human body and may be regarded as a cumulative poison. Both human and animals exhibit toxic effects from chronic ingestion of relatively low levels of lead in water. The 1962 USPHS Drinking Water Standards have a recommended limit of 0.05 mg/l for lead in order to minimize the intake from water. Toxic effects on aquatic life are reported to vary widely with hardness and type of aquatic life but generally to be above 0.1 mg/l.

Four replicate samples were analyzed for lead from some fifty stations within Park waters and all analyses were less than the detectable limit of 0.01 mg/l.

Magnesium

In natural waters, magnesium is a common constituent along with calcium and is generally one of the main cations contributing to hardness of the water. Except in certain dolomitic areas, magnesium is generally present in smaller amounts than calcium.

Like calcium, magnesium is relatively nontoxic and is in fact an essential nutrient for humans. Natural magnesium levels in Park waters are generally less than 2.5 mg/l with concentration of 0.5 mg/l or less occurring at Duck Lake and in the Madison River drainage. Levels below Mammoth Hot Springs on the Gardner River average 12.6 mg/l, apparently from contributions of geothermal water; and concentrations in Soda Butte Creek range from 7 to 12 mg/l associated with general increased dissolved mineral levels in this area.

Manganese

Manganese and iron are often discussed together because of their similar occurrence and behavior in water. Since manganese is much less abundant than iron in most soil and rocks, it is also generally less abundant in water. In concentrations not causing unpleasant tastes, manganese is regarded by most investigators to be of no physiological significance in water. However, because of the staining of laundry and porcelain, the 1962 USPHS Drinking Water Standards has set a recommended limit for manganese of 50 ug/l.

At nearly all locations sampled in the Park natural manganese levels were from 15 to 25 ug/l or generally less than half the drinking water limit. In the vicinity of the high proportions of thermal water in Mary Bay (571020) and Pelican Creek (571016), levels in excess of 100 ug/l were determined. The maximum level observed at any station was 870 ug/l at Cooke City on Soda Butte Creek (293011) just below the mine tailings pile of the McLaren Mine. Average concentration at this station is 361 ug/l based on ten samples over a two-year period. Because of the difficulty of access to this stream during winter minimum flow periods, it is probable that maximum concentrations have not been observed. At several locations in Yellowstone Lake, away from shore, the presence of manganese was undetectable on repeated samples with a detection limit on the analyses of 5 ug/l.

Mercury

Mercury, because of its toxicity, is an undesirable impurity in water. Natural mercury contamination is known from only a few hot springs which deposit the sulfide ore, cinnabar. Inorganic mercury is converted by microbial systems in bottom muds to methyl mercury which is concentrated in fish and shellfish, partly through contamination of their food and partly through its presence in the water.

Because of recent interest in this element and its high toxicity to humans and aquatic life, samples were analyzed from several locations in the Park as part of the 1970 baseline water

quality investigation. Results of the analyses of fish and water samples are presented below:

TABLE 13

RESULTS OF MERCURY INVESTIGATIONS

STORET NO.	DATE	LOCATION	71900 Hg ug/l	71930 Hg mg/kg WET FISH FLESH	REMARKS
293019	5/05/70	Madison at West Entrance	2.4		
	5/23/70		1.6		
	7/21/70		1.4		
	7/30/70		1.5		
571040	5/08/70	Firehole at Madison Junction	2.1		
	5/23/70		1.6		
	7/21/70		1.0		
	8/03/70		1.2		
	5/27/71			0.24	Rainbow Trout 6 to 8"
				0.14	
				0.18	
				0.30	
				0.27	
				0.21	
				0.22	
				0.28	
				0.18	
				0.24	
				0.20	
				0.40	
				0.26	
				0.34	
				0.26	
				0.31	
				0.22	
				0.30	
				0.31	
				0.17	
				0.27	
				0.27	
				0.27	
571041	5/08/70	Firehole River Below Little Firehole	1.8		
	5/23/70		3.4		
	7/21/70		2.4		
	8/03/70		1.6		

STORET NO.	DATE	LOCATION	71900 Hg ug/l	71930 Hg mg/kg WET FISH FLESH	REMARKS
	4/06/71		0.5		
571042	5/08/70	Firehole River above Old Faithful Area	3.4		
	5/23/70		2.8		
	7/21/70		3.2		
	8/03/70		2.0		
	4/06/71		1.0		
				.15	Brown Trout 6 to 10"
				.15 (2)	
				.15 (2)	
				.10	
				.15	
				.15	
				.15	
				.19 (2)	
				.11 (3)	
				.11 (3)	
				.14 (2)	
571061	4/06/71	Firehole at Old Faithful Water Supply Dam	0.4		
571005	5/07/70	Gardner River at Gage Below Mammoth	2.6		
	5/24/70		2.4		
	7/22/70		7.4		
	8/03/70		5.1		
	4/06/71		0.9		
				0.18	Brown Trout 6 to 11"
				0.11	
				0.11	
				0.09	
				0.09	
				0.09	
				0.11	
				0.10	
				0.12	
				0.09	
				0.09	
				0.11	
				0.12	
				0.07	
				0.34	

STORET NO.	DATE	LOCATION	71900 Hg ug/l	71930 Hg mg/kg WET FISH FLESH	REMARKS
				0.08	
				0.12	
				0.10	
				0.09	
				0.08	
				0.07	
				0.07	
				0.07	
				0.13	
				0.06	
571005	4/06/71	Surface Runoff from Mammoth Terraces at Mammoth to Tower Road Crossing	1.7		
571006	4/06/71	Gardner River Upstream of Mammoth Area	0.4		
	7/09/71			0.04	Brook Trout 6 to 9"
				0.04	
				0.05	
				0.06	
				0.08	
				0.02	
				0.07	
				0.06	
				0.04	
				0.05	
				0.07	
				0.06 (3)	
				0.01 (3)	
				0.06 (3)	
				0.03 (3)	
				0.05 (3)	
				0.02 (3)	
				0.06	
571004	7/07/71	Yellowstone Lake at Fishing Bridge		0.28	Cutthroat Trout 10 to 14"
				0.49	
				0.18	
				0.26	
				0.21	
				0.14	
				0.21	
				0.34	

In total, 107 fish and 25 water samples have been collected and analyzed for mercury content. Of these samples, only two water samples had a mercury content above 5 ug/l, the recommended limited set forth in the USPHS Drinking Water Standards. No fish flesh samples contained mercury in excess of 0.5 mg/kg, the tentative FDA limit for human consumption. Based on these analyses, it would appear that there is no significant hazard to human health from eating fish caught in Park waters. There is much work which could be undertaken to document the actual distribution of mercury levels by fish species, age, and location.

Potassium

Both sodium and potassium are common alkali earth metals and each constitutes several percent of the material in the earth's crust. Both sodium and potassium occur in some minerals which are readily dissolved by precipitation or circulating groundwaters; hence, ions of these elements are present in nearly all waters. At low concentrations, as observed in Park waters, potassium is an essential nutrient, especially for plant growth. Reports in the literature concerning detrimental effects of potassium in water are all concerned with levels in excess of 50 mg/l in a water of normal ion makeup. The maximum observed level in Park waters was 8.15 mg/l in the Madison River (571036). All locations sampled below the thermal spring areas on the Gibbon, Gardner, and Firehole Rivers had concentrations of potassium at two or three times the levels observed elsewhere in the Park indicating the probable origin of much of the element to be the discharges from the thermal springs.

Selenium

Selenium is chemically similar to sulfur in a number of respects. Selenium is found in some soils and in waters draining these soils. It is toxic to humans and animals at low levels. The 1962 USPHS Drinking Water Standards level for this element is a mandatory limit of 10 ug/l which is the lowest detectable limit in the current analytical procedure for this element. Waters from several selected main stream locations were tested for selenium but levels in all samples were below the 10 ug/l detectable limit.

Sodium

As discussed under potassium, sodium is generally in relatively easily dissolved minerals in rocks and soil and occurs in nearly all water. All levels observed in Park waters are low, with levels in the Yellowstone and Snake Drainage being 20 mg/l or less. In the Madison River Drainage concentrations downstream of the main thermal areas range from 35 to 75 mg/l, with the Firehole River having the highest levels.

When a high percentage of the total cations in solution are sodium, the water is not suitable for agricultural uses as the exchangeable sodium tends to deflocculate the soil and make it impermeable to water. At the mouth of the Firehole River (571040) the calculated Sodium Absorption Ratio (SAR) is 26.12 and the average conductivity is 388 umhos/cm. According to the data of the U.S. Salinity Laboratory, this would be a C2-S4 water, which has a medium salinity and a very high alkali hazard. 2/ Agricultural water uses in this immediate area are nonexistent; the potential losses due to this natural water quality condition are low.

Zinc

Zinc occurs naturally in waters draining areas of occurence of the ore sphalerite, an important source of zinc. In zinc mining areas, naturally occurring concentrations of 50 mg/l have been observed. There is some evidence of strong permanent absorption of zinc on silt particles with a resultant removal of zinc from solution. Because of undesirable tastes, poor finished water appearance and other undesirable esthetic effects, the USPHS 1962 Drinking Water Standards recommends a limit of 5 mg/l in drinking water.

The literature reports that levels of zinc in excess of 10 ug/l may be harmful to aquatic life. In particular, the hatching and growth of Rainbow trout may be inhibited by concentrations of 10 to 500 ug/l. Other reports on effects to bacteria and other aquatic life indicate levels of about 100 ug/l are cause for concern. 5/

Zinc levels in most waters of Yellowstone Park were less than the 5 ug/l detection limit for this analysis. Zinc was found routinely only on stations in Soda Butte Creek below the McLarens Mill. Current levels at the mouth of Soda Butte Creek average 29 ug/l. On two occasions levels of zinc in excess of 100 ug/l were obtained from analyses of single samples. Other analyses of samples from these same stations indicated levels below detectable limits; additional work should be done in this area to clarify these isolated high results

Chloride

Chloride is present in all natural waters. Table 2 indicates that chloride in detectable quantities occurs even in snow in areas far removed from oceanic waters. Chloride is also present in all rock types, especially evaporite sediments. Chloride may also be present in connate waters trapped in an area during an earlier geologic period and now being added to surface waters. Chloride limits, both those in use as standards and those recommended for use as possible standards, vary over a wide range. A summary of the recommendations for the various beneficial uses indicates that no

significance is attached to levels of less than 50 mg/l. All analyses of Park waters have levels less than this figure.

Maximum concentrations in Park water are found below the thermal spring areas on the Gibbon and on the Firehole Rivers. Average levels in these streams are between 35 to 45 mg/l. Most observed levels in other areas of the Park are less than 10 mg/l.

Measurement of the concentration of the chloride ion is routine, precise, and not too difficult. Routine monitoring of waters for possible indications of pollution generally include chloride analysis.

Cyanide

Current standards for cyanide appear to be based on the toxicity to aquatic life rather than effects on man. Trout are extremely sensitive and are killed by levels of 0.1 to 0.2 mg/l in a short time. The USPHS 1962 Drinking Water Standards mandatory limit has been set at 0.2 mg CN/l, which provides an approximate factor of safety of 100 for human consumption. Cyanide is reported to be toxic to fish at 0.05 mg/l when exposed for a period of five days. 5/

Since cyanide was used in the extraction of ore at the McLaren operation near Cooke City, samples from selected stations in Park waters were analyzed for this constituent. Approximately fifteen samples were tested for cyanide and all levels were less than the detectable limit of 0.01 mg/l.

Sulfate

Sulfates occur naturally in all surface waters as a result of leaching from a number of common minerals. In the waters of Yellowstone Park, sulfate levels are increased by the oxidation of sulfide ions which enter the water from many of the springs and geysers. In many of the geyser areas a sulfur smell is present in the air at all times. The Mud Volcano group of geysers and spring just north of Yellowstone Lake would appear to be responsible for nearly doubling the average concentration of sulfate in the Yellowstone River at this point. Levels in the Yellowstone River upstream of the Mud Volcano are near 8 mg/l, while levels immediately downstream are near 16 mg/l.

Sulfate levels observed in the Park are low and offer no potentially detrimental effects for beneficial uses of the water. At Pelican Creek an average level of 51.8 mg/l was observed which was a maximum for natural conditions in the Park. During winter low flow periods the level of sulfates draining from the tailings piles of the McLaren Mine in Soda

Butte Creek are recorded as high as 210 mg/l but this effect does not appear to extend into Park waters.

At all other locations sampled in the Park the sulfate level was less than 25 mg/l and in many cases less than 10 mg/l.

Total Organic Carbon

The determination for organic carbon utilizes a strong oxidant to oxidize the carbon material in water under standardized conditions. As in the case of BOD, this is an attempt to develop a criterion for the strength of the waste or, in this case, the potential for support of aquatic life in the waters. General levels of TOC in Park waters are near 2.5 mg/l. TOC levels, as observed in Park waters, are all quite low when compared with normal stream water levels in downstream locations, except below areas of thermal water inflows (See Table 2). Much of the limited carbon which is present is expected to be tied up in lignin complexes and humic type acids, as would be expected from this well-wooded area and, hence, is not available for immediate uptake by aquatic life. The low BOD/TOC ratio of all Park waters would tend to support this.

Nitrogenous Compounds

Nitrogen occurs abundantly in nature, is an essential constituent of protein in all living organisms and is frequently recycled within the environment. In sanitary survey work it is common to measure ammonia, organic nitrogen, and nitrates because the relative levels of these forms are indicative of the pollutional state of the waters under study. In Park waters where natural conditions control, interpretation of results is difficult beyond the point that "no significant pollution was found in the locations sampled."

The combined nitrogen available in unpolluted surface waters is probably mainly derived from inflow sources such as precipitation and uncollected surface runoff. Indeed, average nitrogen measurements made on snows in various locations indicate average levels twice those observed in the waters of Yellowstone Park, indicating a substantial uptake of the nutrient by plant and animal life. In lakes like Yellowstone which have seasonal pulses of anabaena, it is likely that this alga makes a significant contribution to the nitrogen undergoing biogeochemical transformation.

Literature reports indicate that ammonia levels of less than 0.2 mg/l are generally the maximum natural stream level and are not detrimental to any beneficial uses. In Park waters, the maximum average ammonia level observed was in the swampy Pelican Creek area and here the concentration was only 0.10 mg/l.

Kjeldahl Nitrogen, which is organic nitrogen plus ammonia, and nitrate-nitrogen levels were less than one-half the average nitrogen level which occurs in snow and rain. Nuisance blooms of aquatic plants in lakes and streams do not generally occur if the nitrate as N is kept below 0.3 mg/l and the total nitrogen as N is below 0.6 mg/l. 5/ All average levels within the Park waters are in this range. It does appear that nitrogen compounds may be contributed by some of the thermal discharges, as indicated by higher levels in these areas. It may be more likely though that these higher levels result from increased biologic activity resulting from higher water temperatures near the thermal areas.

Phosphorus

Phosphorus is commonly the most likely macro-nutrient to be deficient in an aquatic environment and, hence, to limit the biologic activity. For this reason, phosphorus levels are most important to the ecologist. Waters draining the crystalline rocks of mountain regions generally are the most deficient in phosphorus. The literature reports levels in relatively uncontaminated lake districts to be on the order of 10 to 30 ug/l, with ortho or soluble phosphorus being generally a tenth of the total. A maximum concentration of 100 ug/l of total phosphorus in flowing streams and 50 ug/l where waters enter a lake or reservoir should be observed to avoid the danger of supporting undesirable growths. 2/

Only limited analyses were performed at about fifty locations in Park waters. Total P levels range from less than 10 ug/l to 140 ug/l, with nearly all levels between 50 and 70 ug/l. The distribution of the data do not suggest substantial increases from heavily utilized recreational areas, although there is insufficient data to adequately disprove this point. Ortho-phosphorus levels range from less than 10 ug/l to 110 ug/l, with nearly all stations having levels of 10 to 20 ug/l. It would appear that a delicate balance exists with phosphorus levels in many locations at or just below levels necessary to support nuisance growths of aquatic life and serious disruption of the natural aquatic environment.

Sewage effluents are a major source of this nutrient. In Yellowstone Lake near Dot Island, the average concentration of orthophosphate was 30 ug/l during the survey period, which indicates a level of 0.25 pounds of this element per million gallons. At the time of the 1970 survey, the waste treatment plant at Grant Village discharged into Yellowstone Lake a partially treated effluent at a rate of approximately 90 gpm during the tourist season. This effluent contained an average of 13,700 ug/l of orthophosphate. This is equivalent to 114 pounds per million gallons or between 10 and 15 pounds per day over the sixty to ninety day season. Levels at the Bridge Bay

STP, which also discharged into the Lake, were about one-half those at Grant Village. Park Service plans outline higher levels of treatment for the waste waters from these sources.

MICROBIOLOGY

Bacteria have been used as indicators of the sanitary quality of water since 1880, when E. coli and similar organisms were shown to be normal in fecal material. The coliform group, as presently analyzed for, includes organisms that vary in their natural sources and habitats. Included in the Total Coliform analyses are organisms from the feces of human and other warm-blooded animals, from soil, from water and from vegetation. Current practice is to place increasing emphasis on the techniques which are sensitive only to those organisms of fecal origin.

Fecal coliform organisms may be considered to be indicators of recent fecal pollution from warm-blooded animals. It is necessary to consider all fecal coliform organisms as indicative of dangerous contamination. In the absence of fecal coliform organisms, the presence of other coliform group organisms may be the result of less recent fecal pollution, soil-runoff water or, infrequently, fecal pollution containing only those organisms.

The fecal streptococcus group bacteria are now being recommended for consideration in water quality criteria and are used in many stream pollution measurements. Since this group includes several biotypes of limited sanitary significance, colony counts of less than 100 per 100 ml should not be considered as having much value for interpretation other than indicating a lack of severe bacteriological contamination.[10]

The publication, "Report of the Committee on Water Quality Criteria,"[7] provides the following numerical guidelines for evaluating coliform levels in raw waters:

TABLE 14

GUIDELINES FOR COLIFORM LEVELS

Use	Total Coliform	Fecal Coliform
Public Water Supply*		
Mandatory	10,000 MF Colonies/100 ml	2,000 MF Colonies/100 ml
Desirable	100 MF Colonies/100 ml	20 MF Colonies/100 ml

Use	Total Coliform	Fecal Coliform
Primary Contact Recreation**		
Mandatory		200 MF Colonies/100 ml

*Arithmetic monthly mean
**Geometric monthly mean with maximum less than 400 colonies/100 ml

These criteria were developed to provide for adequately safeguarding the public health without unduly restricting the use of the waters for recreational and water supply purposes. Since the use of Total Coliform densities has been well-established in the past, some samples were analyzed for Total, as well as Fecal, Coliform organisms to provide comparative data. In the second portion of the survey effort, Fecal Coliform and fecal streptococcus densities were determined to provide some baseline information according to the currently recommended methods. Sampling for coliform type analysis took place on all major surface water areas in the Park. Samples were collected beginning in early May of 1970 prior to the influx of tourists and also during the maximum Park utilization periods in late July and August of 1970.

The map (Figure 6) presents the maximum and arithmetic average fecal coliform counts on all locations sampled during the survey with the exception of the waste treatment plant data which are presented in Appendix A. Fecal streptococcus counts were generally below the level of sanitary significance at all stations during the survey.

In evaluating the data, the initial conclusion must be that no serious fecal pollution directly attributable to human discharges can be demonstrated in Park waters. Of the twenty-three locations which were sampled in both May and August, fourteen had maximum recorded counts occurring during the pretourist period. Of the other nine, eight had maximum recorded fecal coliform counts of less than 100 colonies per 100 ml. The only station which had a higher count (120 colonies/100 ml) was located outside Park boundaries on the Yellowstone River several miles below Gardiner, Montana. Inadequately treated wastes were known to be discharged by Gardiner to the Yellowstone River.

The highest fecal coliform densities observed during the survey (300 to 500 colonies/100 ml) occurred on the Madison River concurrently with the high snowmelt flows which caused the river to exceed bankfull stage. High concentrations of geese, ducks, and elk were observed in this area at this time and the observed counts are probably from this source. High counts which occurred in Pelican Creek in the Yellowstone

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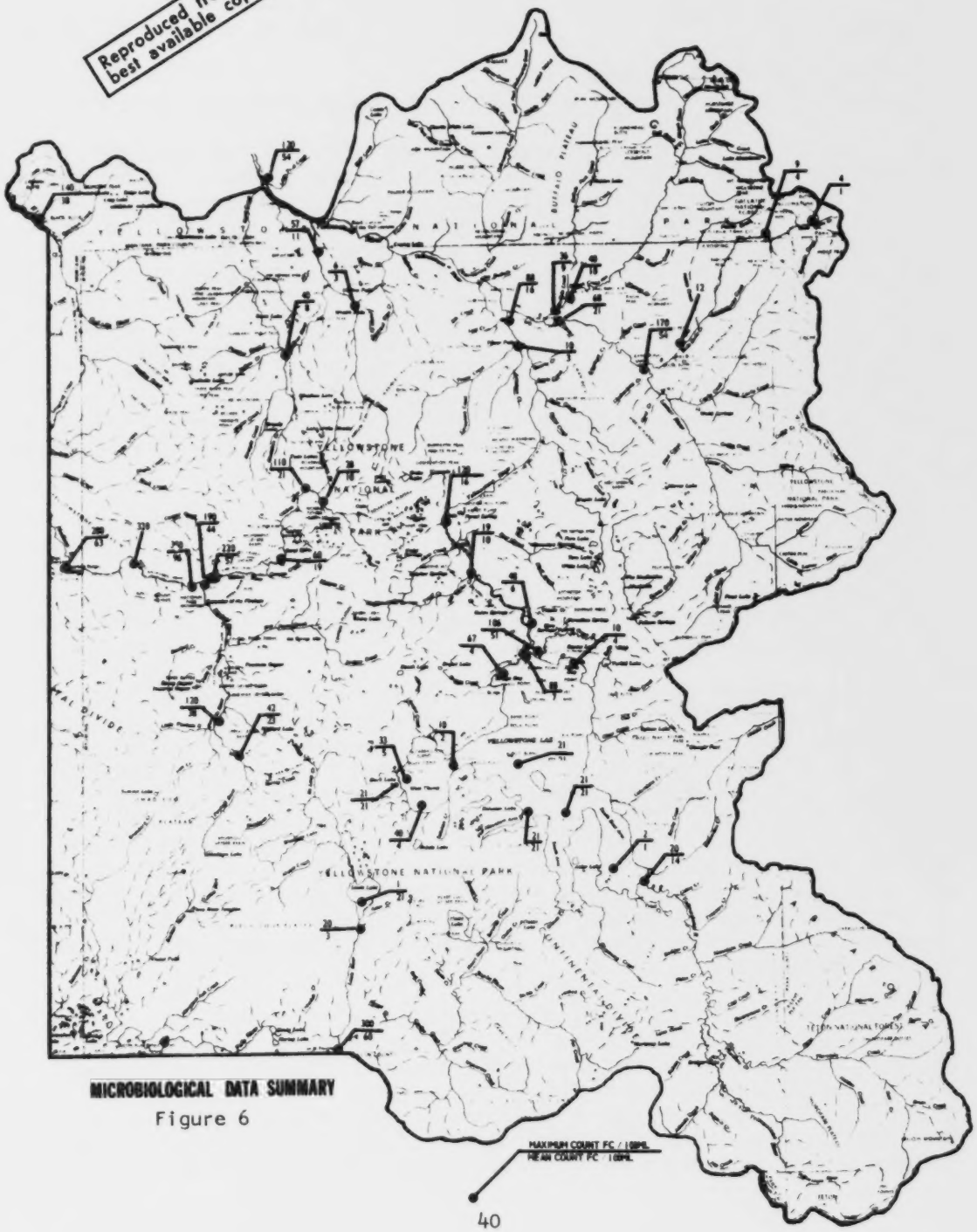

MICROBIOLOGICAL DATA SUMMARY

Figure 6

drainage area can also be attributed to wastes from the numerous wildfowl and other animals concentrated in this area at the time of sample collection.

The maximum count of 170 fecal coliform/100 ml which occurred on the Lamar River was concurrent with the turbid runoff from a severe thunderstorm in that area. This relatively high count also is attributable to animal waste sources, probably most comes from small rodents living near the water.

It should be reiterated at this point that nearly all stations had some fecal coliform counts. Fecal coliform counts are evidence of recent fecal contamination and constitute some public health hazard to persons who use these waters for consumption without adequate disinfection.

BIOLOGY

Introduction

Biological surveys of Yellowstone National Park waters began with the work done by Forbes (1893)[11], who described common zooplankton and general features of Yellowstone Lake. Following Forbes's work was the first intensive report on the flora and fauna of selected streams which was done by Muttkowski (1929)[12]. Since then there has been limited biological work published concerning the Lake and streams within the Park (Seamans, 1940[13]; Benson, 1961[14]; and Sharpe and Arnold, 1966[15]). A discussion of aquatic life and the relationship to water quality and the work of previous investigators follows. Biological surveys were conducted during July 10-21, 1970. In addition, plankton samples were collected in May and August of 1970.

Study Methods

Benthos - Bottom samples from the Lake stations were collected with a Petersen dredge and organisms were separated from bottom sediments by sieving through a U. S. Standard 30 mesh screen. Collections at stream stations utilized a Surber stream bottom sampler used in riffle areas having rocks or rubble of near uniform size. Qualitative samples were obtained from all stream stations by hand or dip net from rocks and other submerged debris. All samples were stored in glass jars and preserved with four percent formalin. Sorting and identification was done in the laboratory.

Phytoplankton - Collections were made in the Lake approximately one foot below the surface using a Kemmerer water sampler. Samples were stored in one liter containers and preserved with four percent formalin. Identification and counting

of the phytoplankton using the Sedgwick-Rafter Cell technique followed the procedure outline in Standard Methods for the Examination of Water and Wastewater, 12th Edition, Park TX, 1965. 9/

Periphyton - Samples were collected at all stream stations by scraping slime from rocks and other submerged objects. Scrapings were stored in glass jars and preserved with four percent formalin. Only diatoms were enumerated using permanent hyrax slides from which proportional counts were made according to procedures outlined by Weber and Raschke (1966). 16/

Station Description

Figure 7 depicts the biological stations for the July 1970 survey. Because of the distance between stations and the many streams sampled, a description of the station locations is presented in Table 15.

TABLE 15

BIOLOGICAL SAMPLING STATIONS AND LOCATION
YELLOWSTONE NATIONAL PARK AND SURROUNDING AREAS
JULY 1970

Station No.	Chem. Data STORET No.	Location
		Yellowstone Lake
YL-1	571025	30 yards offshore from Grant Village STP at West Thumb.
YL-2		65 yards offshore from Grant Village STP.
YL-3		200 yards offshore from Grant Village STP.
YL-4	571026	100 yards offshore from Solution Creek at West Thumb.
YL-5		Inside breakwater at Grant Village Marina.
YL-6		50 yards outside Grant Village Marina entrance.
YL-7		100 yards offshore from Lake Lodge at Bridge Bay.
YL-8		50 yards outside Bridge Bay Marina entrance.

Station No.	Chem. Data STORET No.	Location
YL-9	571017	100 yards inside Bridge Bay Marina.
YL-10		Center slips at Bridge Bay Marina.
YL-11	571004	500 yards south of Fishing Bridge at the outflow of the Lake.
YL-12	571020	200 yards offshore from Beach Springs at Mary Bay.
YL-13		50 yards offshore, southwest point of Stevenson Island.
		Madison River
MR-1	293019	1.5 miles east of West Yellowstone, Montana at USGS gaging station.
MR-2	571036	1 mile downstream from Madison Junction campground at second road turnout.
		Gibbon River
GR-1	571038	3.5 miles northeast of Madison Junction at Mesa Road intersection.
GR-2	571039	3 miles southwest of Norris Junction at Gibbon River Rapids.
		Firehole River
FH-1	571040	0.5 miles upstream from confluence with Gibbon River at Madison Junction.
		Little Firehole River
LF-1		200 yards upstream from confluence with Firehole River at Upper Geyser Basin.
		Iron Creek
IC-1		100 yards upstream from service road bridge and oxidation lagoon fields for Old Faithful resort area.
IC-2		0.5 miles downstream from IC-1, directly behind Emerald Pool.

Station No.	Chem. Data STORET No.	Location
		Soda Butte Creek
SBC-1	293008	0.5 miles east of Cooke City at McLaren Mine, 100 yards upstream from tailings.
SBC-2	293011	Footbridge crossing to Forest Service Amphitheater at Cooke City.
SBC-3	571000	Soda Butte Picnic Area, 2.5 miles southwest of Silver City.
SBC-4	571001	300 yards upstream from Lamar River Confluence.
		Lamar River
LR-1	571010	100 yards upstream from Soda Butte Creek Confluence.
LR-2	571003	20 yards downstream from Northeast Entrance Road bridge crossing.
		Gardner River
GDR-1	571006	3 miles northeast of Indian Creek campground at Sheepeater Cliffs Monument.
GDR-2	571050	1.5 miles north of Mammoth Hot Springs at North Entrance Road bridge crossing.

Lake Benthos

Yellowstone Lake is characteristic of large oligotrophic lakes that have deficiencies in nutrient concentrations and low water temperatures, which in turn limit primary productivity. The limited primary production in Yellowstone Lake is in part compensated by the great production depth, according to Benson (1961)[14], with the most production in terms of benthos occurring at the twenty to thirty foot depth.

The benthos sampling in Yellowstone Lake utilized thirteen stations (Figure 7). Sampling was done along the shoreline in depths of twenty to thirty feet, dredging until soft substrates were found. Stations YL-1 through YL-3 were located in the vicinity of the Grant Village Sewage Treatment Plant outfall in the West Thumb area. The bottom sediments were soft, comprised of fine silt, sand and organic detritus (aquatic plant material). Overlying beds of aquatic plants were

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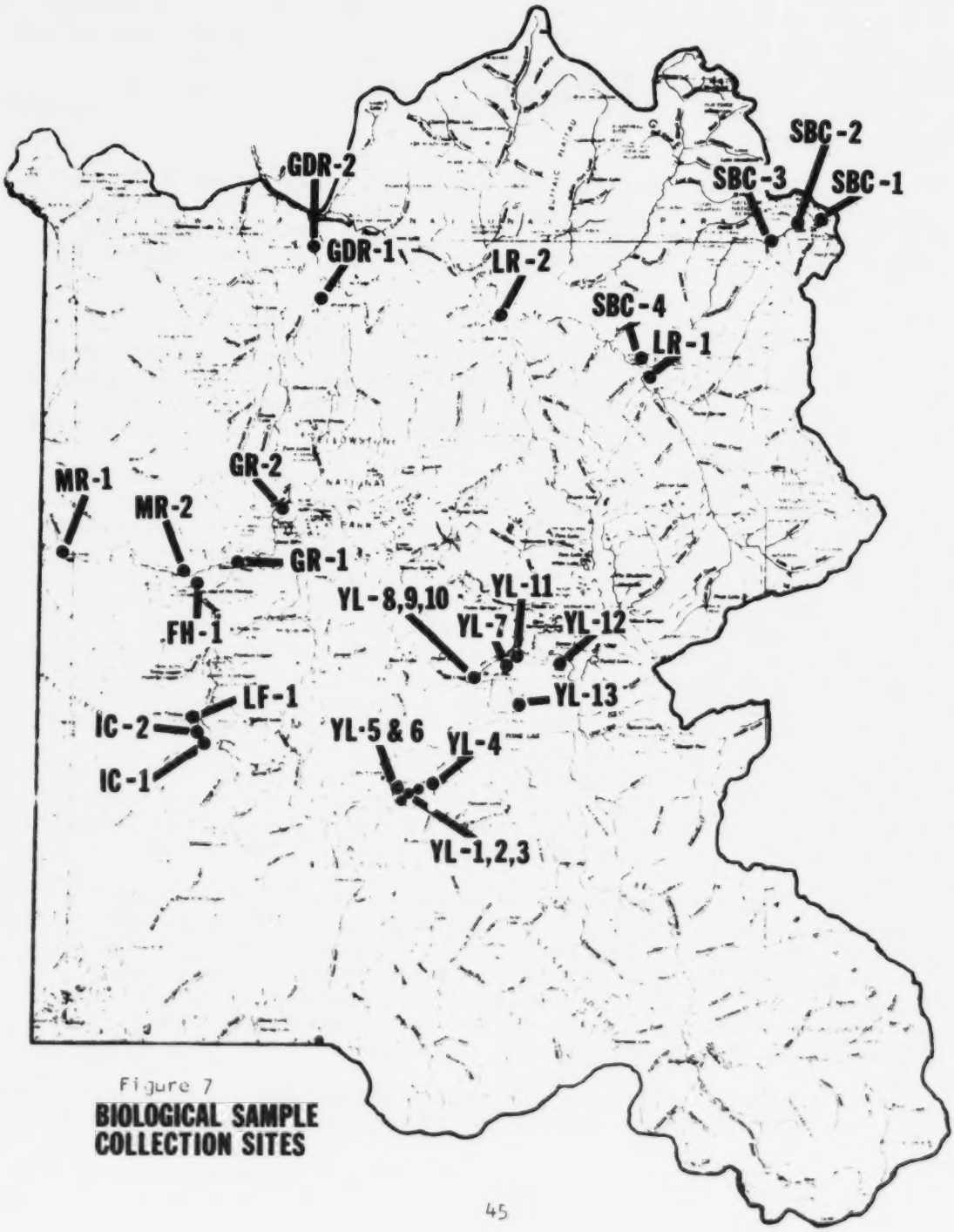

Figure 7
BIOLOGICAL SAMPLE COLLECTION SITES

prevalent in this area with Potamogeton sp., Lemna sp., and Ceratophyllum sp. the most dominant types.

The bottom fauna in this area was composed primarily of amphipods Hyalella azteca, Gammarus lacustris, Diptera (Chironomidae) and Oligochaeta (Tubificidae). Table 16 presents the organisms found and their relative abundance. The number of organisms ranged from sixty-four to four hundred twenty-five per square foot with H. azteca the predominant type. This amphipod, along with Gammarus, is particularly important in the diet of the cutthroat trout and are found in greater numbers around aquatic plant beds.

Station YL-4, located off Solution Creek in West Thumb, had large numbers of H. azteca and also the chironomid larva Tanytarsus sp. The bottom sediments were mainly sand, with some fine silt. The absence of aquatic plant beds was noted in tnis area.

In the Grant Village Marina at Stations YL-5 and YL-6, the bottom organisms were fewer in numbers when compared with previous stations (Table 16). Recent construction of riprap and breakwater structures most likely disturbed the bottom organisms resulting in fewer numbers (10 to 91 per square feet).

In the Bridge Bay area, four stations were sampled, two of which were located inside Bridge Bay Marina. Station YL-7, located offshore from the Lake Lodge, supported an assemblage of organisms numbering seven hundred twenty-six per square foot with H. azteca and chironomid larvae the most abundant forms. Chironomid larvae and sludgeworms (Tubificidae) were the most abundant organisms at stations YL-8 and YL-9. Station YL-10 located in the west end of the marina basin, supported four hundred fourteen organisms per square foot, represented primarily by chironomid larvae and sludgeworms. The abundance of these particular organisms can be explained by the presence of large deposits of silt and organic detritus in the basin providing ample foodstuff and habitat. The area south of Fishing Bridge at Station YL-11 and in Mary's Bay at Station YL-12 also had silt deposits and consequently Tubificidae, chironomid larvae, and sphaeroid clams were predominant.

For comparative purposes, an area was selected near Stevenson Island to represent an exposed, wave-swept shoreline with little or no accumulation of silt and organic matter. (Station YL-13). The bottom was mainly gravel, sand, and rubble supporting approximately one hundred sixty organisms per square foot. The bulk of the collection consisted primarily of H. azteca and the chironomid larva Tanytarsus sp.

The numbers and types of bottom organisms in different areas of the Lake are similar to those recorded by Benson

Table 16 Lake Benthos Types
Macroinvertebrates From Yellowstone Lake, July 1970

STATION	YL-1		YL-2		YL-3		YL-4		YL-5		YL-6		YL-7		YL-8		YL-9		YL-10		YL-11		YL-12		YL-13	
ORGANISM	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft	Qual	No/Sq Ft.
ANNELIDA																										
Glossiphoniidae		13		3		3				3		2										2		1		1
Lumbriculidae		16				9		64						6		2						2		5		2
Tubificidae		19		19		2						2		10		32		40		170		54		37		
CRUSTACEA																										
Gammarus lacustris						3		3		3																
Hyalella azteca		151		22		44		544				51		320		4										117
DIPTERA																										
Cardiocladius sp.		3																								
Chaoborinae		16										11		29						10						
Chironomus sp.								3										5								
Cricotopus sp.						1				1		3		6												
C. Cryptochironomus sp.		6		3				16						6		2						3				
C. Dicrotendipes				13		2		3		1		13		13		1						2				
Culicidae				19												2		4				3				2
Glyptotendipes sp.												6														
Harnischia sp.																				58						
Microtendipes sp.		3												3												
Nanocladius sp.								6																		
Orthocladius sp.		3		6										3												
Polypedilum fallax		10		6										13										6		
Procladius sp.		10						3						10		2		2		16						
Prodiamesa sp.		3												3								2		7		
Psectrocladius sp.		6														1										
Stenochironomus sp.		35												10												
Tanypus sp.														3				3		106				1		1
Tanytarsus sp.		131						720						173		3				22		3		3		28
EPHEMEROPTERA																										
Ameletus sp.																										
Ephemerella sp.										2																3
PELECYPODA																										
Pisidium sp.														118		4				32				4		6
Sphaerium sp.								19														8				
TRICHOPTERA																										
Athripsodes sp.																1										
Hydropsyche sp.												3														
Oecetis sp.								25																		
TOTAL NO./SQ. FT.		425		91		64		1,406		10		91		726		54		54		414		79		64		160
TOTAL NO. TYPES		15		8		7		11		5		8		16		11		5		7		9		8		8

(1961)[14] during the 1957-1958 limnological study conducted by the Rocky Mountain Sport Fishery Investigations. The areas of the Lake protected from wind and heavy wave action supported the largest number of bottom organisms. Sediments composed of fine silt and organic materials with overlying plant beds provided excellent habitat for bottom organisms. In contrast, the rocky, wave-swept shorelines supported only limited populations because of molar action among the rubble bottom and limited food supply.

Stream Benthos

Typically, the mountain streams in Yellowstone National Park are cold, fast-flowing, and highly aerated with a distinctive flora and fauna. During the study period, nine major streams were sampled (Figure 6). The stations were located near population centers to evaluate the possible impact of waste treatment plant effluent discharges into the streams. High flows during the study period hindered sampling of some streams and prohibited the sampling of the Yellowstone River.

All streams sampled upstream and downstream from population centers, with the exception of Soda Butte Creek which will be discussed later, exhibited bottom organism communities typical of unpolluted mountain streams. The species composition of the streams sampled are quite similar to those recorded by Muttkowski (1929)[12] for selected trout streams in the Park. Table 17 lists the types of benthic organisms and their relative abundance found in the representative streams.

To illustrate the types and numbers found throughout the Park, the Gardner River will serve as an excellent example, as it has a major population center (Mammoth Hot Springs) situated along its course. Station GDR-1, located approximately three miles northeast of Indian Creek, was selected as the upstream station from Mammoth, Wyoming. Quantative sampling revealed an abundance of organisms, particularly mayflies (Ephemeroptera) and caddisflies (Trichoptera). Of the two-hundred ninety-four organisms per square foot, the mayflies numbered seventy-eight, with *cinygmula sp.*, *Ephemerella sp.*, and *Heptagenia sp.*, the predominant forms. The caddisflies numbered one-hundred twenty-six per square foot, *Glossosoma sp.* and *Brachycentrus sp.* the most abundant types. The Diptera were represented by a wide variety of types (Table 17), but primarily in the chironomid family. Stoneflies, although not present in large numbers in quantative samples, were present in qualitative collections. The stoneflies were undergoing mass emergence from the nymphal to adult stage, particularly the *Pteronarcys sp.* and *Acroneuria sp.* forms. When this transformation occurs, the nymph climbs out of riffle areas onto dry stones, brush or logs to shed the nymphal skin. This movement from rifle

Table 17 Stream Benthos Types
Macroinvertebrates From Selected Streams in Yellowstone National Park, July 1970

STATION	SC-1		SL-2		FB-1		FB-2		GC-1		GC-2		LT-1		MB-1		MB-2		T-1		SBC-1		SBC-2		SBC-3		SBL-4		LB-1		LB-2		CBB-1		CBB-2	
ORGANISM	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft	Qual	No./Sq. Ft
ANNELIDA																																				
Glossiphoniidae																																				
Lumbriculidae																																				
Tubificidae																					1															
COLEOPTERA																																		3		
Elmidae		160				1						3						1	X	12																
Limnio sp.																																	X			
Zaitzevia sp.					X		X	2	X	6	X																									1
Rhizelmis sp.															X	11	4																		X	
CRUSTACEA																																				
Crangonyx sp.																																				
Gammarus lacustris																																				
Spaeria sexsca															X				X																	
DIPTERA																																				
Antocha sp.					X					3		3			X	1																				
Atherix variegata							X																							9				8		
Bezzia/Palpomyia sp.										1																										1
Cardiocladius sp.					X					1	X			X				X				14	X	28		5		2		1			X	6		1
Chaoborinae																																				
Chironomus sp.																																				
Cricotopus sp.		56				17								X		5	X	19				15	X	3	X	13		1						10		
C. Cryptochironomus sp.																																		17		4
C. Diatomedipes																																				
Culicidae																																				
Dentorophlebia sp.						1				16		15																								
Glyptotendipes sp.																																				
Harnischia sp.																																				
Microtendipes sp.																																				
Nanocladius sp.		52																2				2														
Orthocladius sp.																		2				1								2						
Polypedilum fallax																																				5
Prosiadius sp.							X					2																							X	16
Prodiamesa sp.													X				X																			
Psectrocladius sp.						1	X		X	1	X	1	X			4		18				16	X	10	X	8		1	X	1				2		
Simuliidae	X				X	29	X		X	41	X	149			X	23	X	19	X		X	7	X	5									X	30	X	
Stenochironomus sp.																																	X	2		
Tanypus sp.																																				
Tanytarsus sp.		4				2									X	22	X	13				4														
Tipula sp.																																	X	12		
Trichocladius sp.																																				2
EPHEMEROPTERA																																			X	
Ameletus sp.							X		X									2				3					X									
Baetis sp.		180	X		X					7						10	X	8	X		X	95	X	6	X	26				1	X					6
Cinygmula sp.									X													6	X		X	5	X	23	X	111	X		X	24		
Epeorus sp.	X	20					X		X	7	X	8			X	8	X				X	2			X	8	X	3	X							
Ephemerella sp.	X				X		X		X	3	X			X	X	4	X		X	4	X		X	3			X	15	X	5	X		X	26	X	2
Heptagenia sp.										7										40													X	21	X	
Paraleptophlebia sp.	X				X	23				6	X	30			X	4	X	25	X	40		12			X	16	X	15		13						
Rhithrogena sp.																													X	1			X			13
Stenonema sp.																				2														9		
GASTROPODA																																				
Physa sp.			X												X	1																				
LEPIDOPTERA																																				
Catadysta fulicalis					X																															
Elophila sp.						1									X	12																				
ODONATA																																				
Gomphus sp.			X																																	
Dysmicoryx sp.	X															1	X																			
PELECYPODA																																				
Pisidium sp.																																				
Sphaerium sp.																																				
PLECOPTERA																																				
Acroneuria sp.		4					X				X														X	1					X				X	1
Alloperla sp.																				8							X									
Isoperla sp.										1	X								X		X	4	X	1	X								X		X	
Nemoura sp.	X								X																											
Paraleptophlebia capitata										1										3						7		6					X			1
Perlesta sp.															X	3																				
Pteronarcys sp.	X				X	16			X		X						X																		X	3
TRICHOPTERA																																				
Agapetus sp.																																	X			
Athripsodes sp.																		1																		
Brachycentrus sp.	X				X	440	X		X		X		X		X	50	X	92					X	4	X	10		3	X	3	X		X	58	X	17
Chyrandopsyche sp.						1					X					5	X														X			2	X	
Diplectrona sp.		8																																		
Glossosoma sp.										74						38		15	X						X	18		44						65		
Helicopsyche sp.											X				X																				X	59
Hydropsyche sp.					X				X	1	X	6																			X				X	
Hydroptilidae		57			X					1		9				20						9					X	6		1	X			4		
Lepidostoma americanum										1																										
Limnephilidae										5																										4
Neophylax																						1														
Oecetis sp.					X																															
Oxyethira sp.																																	X			
Parapsyche sp.																					X				X	4		4		1				1		
Polycentropus							X																													
Rhyacophila sp.																						7	X	2	X			4								
Rhyacophilidae													X																							
Total No./Sq. Ft.	456				530		2		116		226				208		244		106		214		62		112		179		46				246		134	
Total No. Types	16		3		20		11		24		19		6		19		22		11		19		10		14		17		13		6		24		23	

areas undoubtably influenced the numbers collected in the quantative samples.

Station GDR-2 was located approximately 1.5 miles downstream from the Mammoth resort area and waste disposal facilities. Sewage treatment is accomplished by a large septic tank, followed by two retention ponds. Effluent from the ponds is chlorinated and dispersed via a ground infiltration ditch in the Gardner River Canyon. The benthos downstream from this area did not reflect the presence of sewage wastes or excessive nutrients. The numbers and types of organisms at this station were similar to those collected upstream at GDR-1 (Table 17). In the quantitive sample, the mayflies and caddisflies were most numerous (104/square foot). The stoneflies, as noted previously, were common in qualitative samples. The numbers and types of bottom organisms collected from the Gardner River indicated exceptional water quality upstream and downstream from large population centers.

In comparison, organisms collected from certain reaches of Soda Butte Creek reflect water quality degradation directly attributed to man's activities centered in the watershed. From 1933 to 1953 the McLaren Gold Mine and Mill operation was located east of Cooke City, Montana, on the north bank of Soda Butte Creek at its confluence with Miller Creek. According to an unpublished report by Mills and Sharpe (1968)17/ the general productivity of the stream has decreased notably since the start of the tailings pile erosion. The leaching of toxic materials from tailings was suspected as the main reason for a decrease in productivity.

In an effort to define the extent of the affected area in Soda Butte Creek, four sampling stations were utilized (Table 15). Station SBC-1, situated upstream from the tailings area, was characterized by a wide variety and abundance of bottom organisms (214/square foot), mayflies and caddisflies were the predominant forms. Approximately 0.75 miles downstream at Station SBC-2 the numbers and types were substantially reduced (62/square foot) compared with the upstream station. Mayflies, caddisflies, and stoneflies were decreased in numbers and types, while the Diptera (chironomid larva) were present in large numbers (Table 17). The gravel bottom was covered with heavy sediment deposits mixed with what appeared to be iron oxides. These sediment deposits and the possible presence of toxic materials eliminated many of the sensitive organisms.

Downstream at Station SBC-3, just inside the Park boundary, and at Station SBC-4, upstream from the confluence with the Lamar River, the bottom organisms improved in numbers and types (Table 17), particularly the mayflies and stoneflies. The stream bottom at these stations was relatively free from silt

deposits and iron oxides common at Station SBC-2.

It is evident that numbers and types of bottom organisms in the vicinity of Cooke City and downstream from the mining operation have been severely affected by either heavy siltation or toxic materials or a combination of both. Partial recovery of aquatic life began within the Park boundary and appears complete downstream at the confluence with the Lamar River.

Yellowstone Lake Phytoplankton

Sampling for phytoplankton in the Lake was limited to grab samples at a predetermined depth for the various stations. Because of the scarcity of phytoplankton, which is characteristic of oligotrophic waters, this type of sampling was intended to evaluate the common genera present and no attempt was made to calculate relative abundance. The phytoplankton from most of the one-liter collections were present in too few numbers to enumerate using the Sedgwick-Rafter Cell techniques, even after concentration by centrifugation. The most abundant phytoplankton present were the diatoms *Melosira sp.*, *Gomphonema sp.*, and *Asterionella sp.* During the August sampling period at the outlet of the Lake, the diatoms were replaced in predominance by a bloom of blue-green algae *Anabaena sp.*, which give a green cast to the water and sometimes form wind-driven deposits on downwind lake shore areas. The phenomenon, which has been previously reported in the literature[14], is thought to be the natural result of the climatic sequence in the area and not attributable to pollution by waste discharges. Table 18 lists the more common genera of phytoplankton encountered during the May, July, and August collections.

Stream Periphyton

The streams and rivers of the Park are free of higher aquatic plants, which is characteristic of cold, fast-flowing mountain streams. Lower plants such as the attached filamentous algae and diatoms occur in small numbers, usually covering rocks in sheltered areas out of the main current. The attached algae *Cladophora sp.* was found forming long plumes in areas of slow current, particularly in the Lamar and Gardner Rivers. For the most part, however, the diatoms forming slime coatings on rocks were the predominant forms of algae. Table 19 lists the periphyton encountered in the Park.

SUMMARY OF BIOLOGICAL INVESTIGATIONS

Biological investigations were conducted on Yellowstone Lake and nine major streams flowing through Yellowstone

TABLE 18

SOME COMMON PHYTOPLANKTON FROM YELLOWSTONE LAKE

May, July, and August 1970

Blue-green Algae (Myxophyceae)

Anabaena sp.

Green Algae, Non-Motile (Chlorophycaea)

Ankistrodesmus sp.

Flagellates (Chlorophyceae, Chrysophyceae)

Chlamydomonas sp.

Chrysococcus sp.

Dinobryon sp.

Diatoms (Bacillariophyceae)

Achnanthes sp.

Asterionella sp.

Cocconeis sp.

Cymbella sp.

Fragilaria sp.

Gomphonema sp.

Melosira sp.

Navicula sp.

Nitzschia sp.

Synedra sp.

TABLE 19

SOME COMMON PERIPHYTON FROM YELLOWSTONE NATIONAL PARK STREAMS

July 1970

Green Algae (Chlorophyceae)

Cladophora sp.

Spirogyra sp.

Diatoms (Bacillariophyceae)

Achnanthes sp.

Cocconeis sp.

Cyclotella sp.

Cymbella sp.

Diatoma sp.

Epithemia sp.

Eunotia sp.

Fragilaria sp.

Gomphonema sp.

Melosira sp.

Navicula sp.

Nitzschia sp.

Pinnularia sp.

Rhizosolenia sp.

Rhoicosphenia sp.

Rhopalodia sp.

Surirella sp.

Synedra sp.

National Park. Comparison of the flora and fauna with previous studies was done to evaluate current and past water quality features in the study areas. From these observations the following conclusions may be drawn:

1. Yellowstone Lake is an oligotrophic body of water with a relatively deep benthic productive area occurring in the twenty to thirty foot range.

2. The predominant lake benthos are the amphipods Hyalella azteca and Gammarus lacustris with oligochaets and chironomids occurring in large numbers in areas of heavy silt deposits. The rocky shorelines free from large silt deposits supported smaller numbers of bottom organisms.

3. Areas of degradation caused by sewage disposal or other man-related activities centered around the Lake were not evidenced by the presence or absence of bottom organisms.

4. The phytoplankton which was never very abundant (typical of oligotrophic waters) was represented mainly by the diatoms Melosira sp. and Gomphonema sp. However, a large bloom of blue green algae Anabaena sp., which apparently occurs annually, was observed in the Lake outlet during August 1970.

5. The benthos and phytoplankton collected in 1970, when compared with previous studies on the Lake during 1954-1959, indicated no significant change in species composition.

6. The stream benthos and periphyton reflected water of excellent quality throughout the Park, with the exception of Soda Butte Creek.

7. In the vicinity of Cooke City, Montana, a decrease of numbers and types of bottom organisms in Soda Butte Creek indicated marginal water quality. Heavy sediment deposits and the probability of toxic materials leaching from upstream mine tailings severely affected aquatic life in this area. However, the stream benthos in the downstream reaches within the Park improved in numbers and types, indicating recovery in the Lamar River below its junction with Soda Butte Creek.

8. The flora and fauna of the Park streams have remained relatively unchanged since the first intensive surveys in 1929.

PESTICIDES

The following key locations were selected for pesticide analyses to provide background information for future investigators.

TABLE 20

PESTICIDES SAMPLING LOCATIONS

STORET No.	SEWL Lab. No.	Sampling Date	Location
293015	4341 and 6529	5/07/70 7/22/70	Yellowstone River at Gardiner upstream of US-89 bridge from left bank looking upstream.
571998	4342 and 6530	5/08/70	Snake River at South Park Boundary. Left bank at Gaging Station.
293019	4343 and 6531	5/08/70 7/23/70	Madison River near West Entrance. Sampled from right bank looking upstream at turnout about 1.5 miles east of West Yellowstone

Samples were analyzed in the Environmental Protection Agency's Southeast Water Laboratory, Athens, Georgia, by conventional gas chromatography. The minimum detection limits for the pesticides included in the analyses are tabulated below:

TABLE 21

ANALYTICAL DECTABLE LIMITS

	ug/l Minimum Detection Limit
Aldrin	0.005
Lindane	0.002
Chlordane	0.05
Chlorobenzilate	0.5
DDD	0.01
DDT	0.02

Dieldrin	0.01
Endrin	0.02
Heptachlor Epoxide	0.01
Heptachlor	0.005
Methoxychlor	0.1
Toxaphene	0.25
Diazinon	0.2
Guthion	0.5
Malathion	0.2
Methyl Paration	0.02
Parathion	0.04

Results of the analyses are as follows:

TABLE 22

PESTICIDES ANALYTICAL RESULTS

Station Number	Date	Results
293015 - Yellowstone River	5/08/70	No pesticides detected
	7/22/70	DDE 0.01 ug/l
		Arachlor 1248* 0.1 + 0.05 ug/l
571998 - Snake River	5/08/70	No pesticides detected
	7/20/70	DDE 0.03 ug/l
		DDT 0.02 ug/l
		Arachlor 1248 0.2 + 0.1 ug/l
293019 - Madison River	5/08/70	No pesticides detected
	7/23/70	DDE 0.06 ug/l
		DDT 0.01 ug/l
		Arachlor 1248 0.2 + 0.1 ug/l

* Arachlor 1248 is not a pesticide. Its significance is discussed below.

DDT has been used so widely that it has been found to be present in the air, water, and plant and animal tissues at nearly all locations in civilized areas.[18] In a recent study in England, rain water was analyzed for a number of pesticides, including DDT. At all sites and throughout the year rain water contained alpha-BHC, gamma-BHC, dieldrin, pp'DDT, pp'DDE, and pp'TDE. The concentrations were minute, being of the order of parts /10^{11} or part /10^{12}.[19]

Evaluation of the toxic effects of pesticide, especially long-term effects is extremely complex. Such factors as type of pesticide, method of application, species, age, position in the food chain, and a host of other environmental factors influence the long and short-term effects of pesticides.[20]

The only current statement regarding desirable limits for general environmental preservation is one of 0.050 ug/l for chlorinated hydrocarbons recommended by the Committee on Water Quality Criteria.[7]

Arachlor 1248 is a polychlorinated biphenyl (PCB), a class of chemicals recently found to be prevalent and persistent in the environment. These chemicals are widely used in the electrical industry because of their thermal stability and fire resistance. Other uses include epoxy paints, wood coatings, adhesives, and carbonless reproducing paper. The major suspected route of entry into the ecosystem is by incineration, especially of business forms containing carbonless paper and plastics and spent ballasts from fluorescent light fixtures. Another suspected source is land runoff from dump areas.

Significance of these compounds is related to their chronic toxicity, especially relating to the formation of thin-shelled birds eggs. This relatively recently discovered pollutant is discussed in detail in a paper by Carl G. Gustafson in Environmental Science and Technology.[21]

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APPENDIX A

Evaluation Of Treatment Facilities

Yellowstone National Park

I. INTRODUCTION

During the period from August 10-17, 1970, an evaluation of the treatment facilities in Yellowstone National Park was made in conjunction with the water quality study conducted by the Federal Water Quality Administration. The objectives of the evaluation were two-fold. Those treatment plants that were discharging directly to the natural surface waters in the Park were sampled to determine their waste contributions, including the plants at Canyon, Bridge Bay, and Grant Village. Secondly the operational procedures at all the secondary treatment facilities were observed with the purpose of improving operation where possible. The majority of other facilities in the Park which do not provide secondary treatment were also observed.

II. DISCUSSION

The most common type of treatment presently used in the Park is a septic tank followed by some type of land disposal. Present plans, however, call for major changes in the wastewater treatment program within the Park to upgrade treatment levels. The construction of new or expanded treatment facilities is planned at each disposal site. A description of present and proposed treatment works is presented in Table A-1. Plans for future actions are included in a report entitled "Master Sewerage Study, Yellowstone National Park, November 1968" prepared by Metcalf and Eddy Engineers and other more detailed project planning for the various facilities. Facilities planning is in conformance with the Park Service Master Plan for management of Yellowstone Park.

A. Canyon Village

The effluent from the Canyon Village septic tank discharges directly to the Yellowstone River. To determine the plant's efficiency and the strength of the waste being discharged, the influent and chlorinated effluent were composited hourly for a six-hour period beginning at 6:00 a.m. August 16, 1970. Table A-2 lists the results of the Canyon Village Composite. Since no flow measuring devices were available at Canyon Village to allow proportional compositing, uniform grab samples were composited.

As shown in Table A-2, the chlorinated effluent showed an increase in pH from 6.9 at 6:00 a.m. to 7.9 at 12:00 noon, a decrease in dissolved oxygen from 1.9 mg/l at 7:00 a.m. to 0.7 mg/l at 11:00 a.m. and a decrease in chlorine residual from 2.5 mg/l at 7:00 a.m. to 0.5 mg/l at 11:00 a.m. All of these trends are typical of the increasing waste load that occurred during the period of the composite.

The B.O.D. of the influent composite was 155 mg/l, while the B.O.D. of the chlorinated effluent was 92 mg/l. This represents a reduction of about 41 percent. Since chlorine has the

TABLE A-1

PRESENT AND PROPOSED WASTEWATER TREATMENT FACILITIES
YELLOWSTONE NATIONAL PARK
YELLOWSTONE WATER QUALITY SURVEY

AUGUST 1970

Location	Present Type Of Treatment	Final Effluent Disposal	Proposed Treatment
Mammoth Hot Springs	Septic tank plus chlorination and sludge drying beds	Percolation lagoons	Wastewater is to be piped to community of Gardiner, Montana for disposal in municipal lagoons.
Norris Area	Septic tanks	Subsurface percolation	Septic tanks plus improved subsurface disposal systems - septic tanks to be sized to hold sludge for entire season
Madison Junction	Trickling filter secondary treatment plus chlorination - anaerobic sludge digestion	Percolation lagoons	Secondary treatment by aerated lagoon followed by evaporation - percolation lagoons
Old Faithful Area	Septic tank and sludge drying beds	Percolation lagoons	Secondary treatment by variations of the activated sludge process with phosphorus removal-discharge to evaporation percolation lagoons
West Thumb Area	Septic tank and pumping system	Spray irrigation	Abandon facilities and discharge to Grant Village sewage system
Grant Village	High rate trickling filter secondary treatment plus chlorination - anaerobic sludge digestion	Dilution in Yellowstone Lake	Expand the present system to include growth and West Thumb - effluent disposal to evaporation percolation lagoon.
Bridge Bay Area	Secondary treatment by extended aeration activated sludge followed by chlorination	Dilution in Yellowstone Lake	Abandon facilities and discharge to new secondary plant to be constructed near Fishing Bridge Area
Lake Area	Septic tank	Sand filtration	Abandon facilities and discharge to new secondary plant to be constructed near Fishing Bridge Area
Fishing Bridge Area	Septic tanks and a sludge lagoon	Percolation lagoons	Secondary treatment by variations of the activated sludge process, anaerobic dentrification lagoons. Final effluent to percolation - evaporation lagoons.
Canyon Area	Septic tank plus chlorination also sludge drying bed	Dilution in Yellowstone River	Secondary treatment by variations of the activated sludge process plus chlorination - effluent to go to Yellowstone River a/
Tower Area	Pit toilets, cesspools and septic tanks	Spray irrigation and subsurface percolation	New septic tanks and drain fields

a/ Plant scheduled for completion in 1973.

TABLE A-2

CANYON VILLAGE COMPOSITE
YELLOWSTONE WATER QUALITY SURVEY

August 16, 1970

PLANT INFLUENT					
Time	Temp. °C	pH	BOD mg/l	Fecal Coliform Bacteria MF/100 ml	Fecal Streptococci Bacteria MF/100 ml
6:00 a.m.	13.5	6.9	-	-	-
7:00 a.m.	16.5	7.3	-	-	-
8:00 a.m.	16.0	7.5	-	2,500,000	2,300,000
9:00 a.m.	16.0	7.7	-	-	-
10:00 a.m.	17.5	7.8	-	-	-
11:00 a.m.	17.0	7.7	-	-	-
12:00 Noon	18.5	8.1	-	-	-
Composite	-	-	155	-	-

CHLORINATED PLANT EFFLUENT							
Time	Temp. °C	pH	Dissolved Oxygen mg/l	Chlorine Residual mg/l	BOD mg/l	Fecal Coliform Bacteria MF/100 ml	Fecal Streptococci Bacteria MF/100 ml
6:00 a.m.	13.5	6.9	-	-	-	-	-
7:00 a.m.	17.5	7.4	1.9	2.5	-	-	-
8:00 a.m.	17.0	7.7	-	-	-	<1	<1
9:00 a.m.	17.0	7.5	1.4	2.5	-	-	-
10:00 a.m.	17.0	7.6	-	-	-	-	-
11:00 a.m.	17.5	7.8	0.7	0.5	-	-	-
12:00 Noon	17.5	7.9	-	-	-	-	-
Composite	-	-	-	-	92	-	-

effect of oxidizing the B.O.D., a portion of this reduction can be attributed to the relatively high chlorine residuals maintained at the plant.

The effectiveness of the chlorination is indicated by the effluent concentrations of fecal coliform and fecal streptococcus bacteria. Both were less than one per 100 ml.

At the time of the composite the sludge drying bed was full of wet sludge. The plant operator informed us that they had always experienced difficulty in dewatering the sludge on the Canyon drying bed.

B. Madison Junction

Since the Madison Junction Plant is a secondary (trickling filter) treatment facility, an investigation was made to determine if any improvements could be made in operational procedures. No samples were scheduled to be taken, since the plant is designed to discharge to percolation lagoons and, therefore, it should not directly effect the surface waters of the Park. However, a visit to the Madison Plant on August 15, 1970, revealed that the trickling filter was not functioning properly and the effluent was being discharged to a drainage ditch which eventually led to the Madison River.

The visit also revealed that the distribution arms on the trickling filter were not functioning. The plant was operating in this manner because the recirculation pump for the filter and the effluent pump had broken down and Park personnel were unable to get the needed parts for repair. In effect, the plant at Madison was providing only primary treatment with chlorination.

C. Grant Village

Grant Village is provided secondary treatment by a high rate trickling filter plant which was constructed in 1962. The chlorinated plant effluent is discharged directly to Yellowstone Lake. Future plans call for expanding the present trickling filter plant and disposal of the effluent to an evaporation-percolation lagoon. Monitoring wells are to be installed to monitor for possible movement of pollutants from the lagoons to Yellowstone Lake.

An investigation of the Grant Village Plant was made on August 12, 1970, including a twelve-hour composite. The results of the composite sampling are shown in Table A-3. The percentages of B.O.D. (69%) and turbidity (42%) reductions indicate that the plant was not performing at optimum. The plant operator stated that they had experienced a power failure at the plant during the week prior to the investigation. As a result, all of the growth on the filter media had been lost. Table A-4

TABLE A-3

GRANT VILLAGE COMPOSITE[a]
YELLOWSTONE WATER QUALITY SURVEY

August 12, 1970

	BOD_5 mg/l	pH SU	Turb. JTU	Total Kjeldahl Nitrogen As N mg/l	Ammonia-Nitrogen As N mg/l	$NO_2 + NO_3$ Nitrogen As N mg/l	Ortho Phosphorus As P mg/l	Total Phosphorus As P mg/l	Fecal Coliform Colonies MF/100 ml	Fecal Streptococci Colonies MF/100 ml	Flow gpd
Grant Village Influent Composite	232	8.1	60	78	59	0.06	12.6	17.0	20,000,000[b] 7,200,000[c]	19,000,000[b] 5,300,000[c]	180,000
Grant Village Effluent Composite (Chlorinated)	71	7.3	35	61	50	0.90	14.4	17.2	1[b] 1[c]	1[b] 1[c]	180,000
% Reduction	69	-	42	-	-	-	-	-	-	-	-
Lbs. Discharged To Yellowstone Lake Per Day	104	-	-	91	75	1.4	21.6	25.8	-	-	-

a. Composited 12 hours (8:00 a.m. to 8:00 p.m.)
b. Grab sample taken at 10:00 a.m.
c. Grab sample taken at 12:00 Noon

gives values obtained from grab samples taken before the power failure occurred which indicate that the plant was producing a somewhat better effluent.

TABLE A-4

GRANT VILLAGE STP EFFLUENT
GRAB SAMPLES
YELLOWSTONE WATER QUALITY SURVEY

Date	B.O.D.5 mg/l	Turbidity JTU
July 31, 1970	48	24
August 2, 1970	34	20
August 3, 1970	--	22

The plant operator was only able to spend a few hours per day operating the Grant Village Plant. Most of that time was spent maintaining the equipment and pumping the raw sludge from the primary clarifier. No sludge was drawn from the final clarifier since the sludge scraper mechanism was inoperable. This condition added to the degradation of the effluent quality. Limited testing was done at the plant to increase process control and thus effluent quality. Samples were collected for analysis to monitor the plant's performance. The effectiveness of the chlorination at the Grant Village Plant is indicated by the very low (less than 1) concentration of fecal coliform and fecal streptococcus in the plant effluent. As at other plants, the chlorine residual in the Grant Village effluent was maintained at 2 mg/l or greater.

Table A-3 shows the calculated load in pounds per day of total nitrogen (92.4), total phosphorus (25.8) and B.O.D. (104) discharged to Yellowstone Lake. Although these loads are small in comparison with loads from normal domestic plants, they are large in an area such as Yellowstone since they represent a real source of degradation to the high quality waters in Yellowstone Lake.

D. Bridge Bay

The Bridge Bay Area waste is treated by a package extended aeration plant followed by chlorination with the effluent discharging directly to Yellowstone Lake. Future plans include abandoning the Bridge Bay Plant and combining the wastes from Bridge Bay, Lake and Fishing Bridge Areas for treatment in a new secondary plant to be constructed near the Fishing Bridge Area. Final effluent disposition will be to evaporation percolation lagoons. Monitoring wells are to be installed to

check for movement of pollutants towards the Yellowstone River.

A twelve-hour composite was made at the Bridge Bay Plant on August 13, 1970. The results are listed in Table A-5. The percentage of B.O.D. reduction at the Bridge Bay Plant (83%) was the highest observed anywhere in the Park. It is noted that the effluent sample was taken prior to chlorination and thus the effluent B.O.D. concentration would have been lower due to the oxidation of a portion of the B.O.D. by the chlorine.

The percentage reduction of turbidity (93%) and the low turbidity value (4 JTU) for the effluent also indicate that the plant was functioning well.

The sample taken of the chlorinated effluent for fecal coliform and fecal streptococcus analysis was contaminated by sludge deposits in the effluent channel because no suitably accessible location was available to obtain a good sample. Therefore, the high concentration of these organisms found in the effluent are not believed to be representative. As at other plants, a 2 mg/l or greater concentration of chlorine was maintained in the effluent.

As at Grant Village, the contributions of total nitrogen (27.2 lbs/day), total phosphorus (3.1 lbs/day) and B.O.D. (22 lbs/day) are small but they do constitute a controllable source of pollutants to the pristine waters of Yellowstone Lake.

E. Other Facilities

Other visitor centers in Yellowstone Park, other than those discussed previously, are all served by septic tanks. This type of treatment is no longer acceptable at the larger installations in the Park. This has been recognized and Park Service planning recommends abandonment of most of the Park's septic tanks and replacement with more advanced forms of treatment.

The majority of the septic tanks and their locations were observed during the plant evaluation. However, other than the infrequent interval of sludge draw off for disposal at dump sites and the maintenance of chlorination equipment at the sites where it was used, little can be done to influence the performance of a septic tank. Therefore, no recommendations or detailed evaluations were made at the visitor centers served by septic tanks.

III. SUMMARY AND CONCLUSIONS

1. Efforts in the past and future plans for protecting water quality bear out the desire of the Park Service to maintain the high quality waters in Yellowstone Park. The

TABLE A-5

BRIDGE BAY COMPOSITE[a]
YELLOWSTONE WATER QUALITY SURVEY

August 13, 1970

	BOD_5 mg/l	pH SU	Turb. JTU	Total Kjeldahl Nitrogen mg/l	Ammonia-Nitrogen As N mg/l	$NO_2 + NO_3$ Nitrogen As N mg/l	Ortho Phosphorus As P mg/l	Total Phosphorus As P mg/l	Fecal Coliform Colonies MF/100 ml	Fecal Streptococci Colonies MF/100 ml	Flow gpd
Bridge Bay Influent Composite	377	8.3	60	98	45	0.08	7.8	11.8	2,800,000[b] 1,300,000[c]	21,000,000[b] 4,100,000[c]	41,000
Bridge Bay Effluents Composite (Unchlorinated)	64	7.8	4	72	68	0.63	7.8	9.2	840[b]	63,000[b]	41,000
% Reduction	83	-	93	--	--	--	-	--	-	-	-
Lbs. Discharged To Yellowstone Lake Per Day	22[d]	-	--	25	23	2.2	2.7	3.1	-	-	-

a. Composited 12 hours (8:15 a.m. to 8:15 p.m.)
b. Grab sample taken at 10:00 a.m. (Effluent sample was contaminated)
c. Grab sample taken at 12:00 Noon (No effluent sample taken)
d. Does not include reduction due to heavy chlorination

investigation found that many wastewater treatment facilities were no longer adequate to meet the demands of increased visitation. However, construction of new or modified facilities is either underway or being planned to upgrade treatment at all major visitor centers.

2. Many treatment facilities in the Park have no back-up systems to keep them operating if failure occurs. Examples are the pumps that failed at Madison Junction and the power failure at Grant Village. In both of these cases, the failures reduced treatment to unacceptable levels. Even short breakdowns can cause loss of biological secondary treatment systems which can be catastrophic to plant efficiencies due to seasonal operation of the plants.

3. Additional attention to the operation and maintenance of wastewater treatment works is needed. Consistent and improved performance from treatment facilities can be achieved through better operational control. The number of personnel assigned to wastewater management was insufficient to allow adequate time for operational control. Personnel responsible for operating wastewater treatment facilities, although sincere, were not always aware of the fundamentals of treatment and as such were unable to adequately control the plant processes to obtain optimum plant efficiencies. Proper operation will become increasingly important considering that planned facilities will be much more complex than existing systems.

4. The potential for degradation of Yellowstone Lake exists from the existing direct discharges of treated effluent to the lake. A policy of no direct discharges to the lake has been established for the new treatment facilities. The no discharge policy has also been applied to all other new facilities except Canyon Village where it wasn't deemed necessary at this time. The use of evaporation - percolation lagoons for final effluent disposition will be monitored to determine if pollutants are reaching surface or ground waters.

5. The practice of heavy chlorination in the Park proved very effective in killing the indicator organisms fecal coliform and fecal streptococcus. Chlorination is adequate for disinfection of wastewater but it is no substitute for proper treatment. The practice of heavy chlorination should be viewed with caution however, since research has indicated that chlorine and chloramine residuals may be toxic to aquatic life. Provision of backup systems and use of evaporation percolation lagoons will minimize the need for intensive dosage of partially treated effluent during times of operational difficulties.

IV RECOMMENDATIONS

1. Project planning should be finalized and construction initiated at an early date in order to implement the facilities improvement program outlined for the Park.

2. Wastewater treatment works should have backup systems to minimize interruptions in operation due to mechanical and electrical system malfunctions. Standby electrical power systems should be provided at all electrically operated treatment works. Adequate supplies of spare parts should be maintained for electrical and mechanical equipment.

3. Increased emphasis should be placed on facilities operation and maintenance. Additional qualified personnel are needed to provide active supervision of the treatment works. Training of operating personnel is needed to provide the operators with a basic understanding of wastewater characteristics and the functions of various treatment units. Training should also provide the operators with the ability to perform essential analytical tests and to maintain plant operating records. The training objectives can be met by sending the operators to short courses on fundamentals of waste water treatment and providing on-the-job training by qualified personnel. Assistance is available from the Environmental Protection Agency for the establishment of an operator training program.

4. Elimination of the direct discharges to Yellowstone Lake should be expedited. Results of the monitoring program should be evaluated periodically to determine the effectiveness of evaporation-percolation lagoons. If the lagoons are ineffective then other alternatives for disposal should be evaluated, e.g., spray irrigation or tertiary treatment of effluent.

APPENDIX B

Sample Station Location Descriptions

STORET NUMBER	STATION NAME	STATE	MAJOR BASIN	MINOR BASIN
		DESCRIPTION		
169996	WARM R AT WM. H. RR STATIONS	IDAHO	PACIFIC NORTHWEST	SNAKE RIVER
		WARM RIVER AT WARM RIVER RAILROAD STATION IN FREMONT COUNTY, IDAHO FWQA - YP-102		
169997	SNAKE RIVER AT US-191 BRIDGE	IDAHO	PACIFIC NORTHWEST	SNAKE RIVER
		SNAKE RIVER AT US-191 BRIDGE AT ASHTON IN FREMONT COUNTY, IDAHO FWQA - YP-101		
169998	FALLS R 2 MI W OF TARGHEE FOREST	IDAHO	PACIFIC NORTHWEST	SNAKE RIVER
		FALLS RIVER 2 MILES WEST OF TARGHEE NATIONAL FOREST BOUNDARY AT COUNTY ROAD BRIDGE IN FREEMONT COUNTY, IDAHO, FWQA - YP-100		
169999	FALLS R. BELOW BECHLER R. JUNC	IDAHO	PACIFIC NORTHWEST	SNAKE
		ON FALLS RIVER BELOW JUNCTION WITH BECHLER RIVER AT THE COUNTY ROAD BRIDGE IN FREMONT CO., IDAHO. TO REACH SAMPLE COLLECTION POINT GO SIX MILES EAST OF JUNCTION US-20 AND IDAHO SR-47. FWQA STA YP-39		
293008	SODA BUTTE CR ABOVE MCLAREN MINE	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
		ON SODA BUTTE CREEK ABOVE MCLAREN MINE .5 MILE EAST OF COOKE CITY, PARK COUNTY, MONT. TO REACH SAMPLE COLLECTION POINT PARK AT THE YELLOW WASTE PILES AND WALK TO THE NORTH BANK OF THE CREEK 150 YARDS ABOVE THE MINE NE 1/4 SEC 25, T95, R14E, FWQA STA YP-14, SB-1 LAT 4501000 10955000 LONG		
293009	CR. ABOVE MCLAREN MINE TAILINGS	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
		ON AN UNNAMED CREEK ABOVE THE MCLAREN MINE TAILINGS ONE THIRD MILE EAST OF COOKE CITY, PARK CO., MONTANA. TO REACH THE SAMPLE COLLECTION POINT PARK ON THE GRAVELED ROAD TO MCLAREN'S MINE AND GO UPSTREAM BUT DOWN-STREAM FROM THE CONCRETE CULVERTS UNDER U.S. HIGHWAY 212. NE 1/4 SEC 25, T95, R14E FWQA STA YP-13, SB-2 LAT 4501000 10956000 LONG		
293010	CR. BELOW MCLAREN MINE TAILINGS	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
		ON AN UNNAMED CREEK BELOW MCLAREN MINE TAILINGS IN PARK CO., MONT. TO REACH THE SAMPLE COLLECTION POINT GO .25 MILES EAST OF COOKE CITY, PARK ON GRAVEL ROAD TO THE WHITE CABIN AND WALK TO THE NORTH BANK OF THE STREAM CLOSE TO THE CORNER OF THE OLD CONCRETE FOUNDATION. NE 1/4 SEC 25, T95, R14E, FWQA STA YP-12, SB-3 LAT 4501000 10956000 LONG		
293011	SODA BUTTE CR. AT COOKE CITY	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
		ON SODA BUTTE CREEK AT COOKE CITY, PARK CO., MONT. TO REACH SAMPLE COLLECTION POINT DRIVE ACROSS BRIDGE OVER SODA BUTTE CREEK ON THE GRAVELED ROAD TO THE AMPHITHEATER. PARK AT THE FOREST SERVICE AMPHITHEATER AND GO TO THE SOUTH BANK AT THE FOOT BRIDGE FROM COOKE CITY TO THE AMPHITHEATER. SW 1/4 SEC 25, T95, R14E, FWQA STA YP-11, SB-4 LAT 4501000 10956000 LONG		
293012	WOODY CR. ABOVE COOKE CITY	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
		ON WOODY CREEK .125 MILES SOUTH AND ABOVE COOKE CITY, PARK CO., MONT TO REACH POINT DRIVE ACROSS THE BRIDGE OVER SODA BUTTE CREEK AND GO JUST UPSTREAM FROM THE METAL CULVERT OVER WOODY CREEK ON THE NORTH BANK. SW 1/4 SEC 25, T95, R14E, FWQA STA YP-10, SB-5 LAT 4501000 10956000 LONG		

STORET NUMBER	STATION NAME	STATE	MAJOR BASIN	MINOR BASIN
		DESCRIPTION		
293013	SODA BUTTE CR. BELOW COOKE CITY	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
	ON SODA BUTTE CREEK .75 MILES BELOW AND WEST OF COOKE CITY, PARK CO., MONT. THE SAMPLE COLLECTION POINT CAN BE REACHED BY DRIVING TO THE END OF THE FIRST DIRT ROAD TURNING LEFT OUT OF COOKE CITY AND GOING TO THE NORTH BANK OF THE STREAM SW 1/4 SEC 26, T95, R14E, FWQA STA YP-9, SB-6 LAT 4501000 10957000 LONG			
293014	YELLOWSTONE R. BELOW GARDINER	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
	ON SHORE OF STREAM NEAR THE NORTH YELLOWSTONE PARK BOUNDARY STATION 4.4 MILES BELOW GARDINER, PARK CO., MONT. SAMPLE COLLECTION POINT IS REACHED BY DRIVING ALONG US-89 ABOVE GARDINER ON EAST SIDE OF RIVER AND CLIMBING DOWN BANK. FLOW FOR THIS STATION IS DETERMINED FROM USGS-6-1915 AT CORWIN SPRINGS. FWQA STA YP-0.5			
293015	YELLOWSTONE RIVER AT GARDINER	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
	AT BANK OF YELLOWSTONE R. OPPOSITE CONCESSIONAIRES WAREHOUSE BLDG. SITE IS REACHED BY CLIMBING DOWN BANK AT US-89, CROSSING AND WALKING UPSTREAM ON NORTH BANK. ACCESS IS DIFFICULT. FWQA STA YP-1			
293017	GALLATIN R. AT US-191 CROSSING	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
	ON THE GALLATIN RIVER AT THE US-191 HIGHWAY CROSSING IN GALLATIN CO., MONTANA. IT IS 23.6 MILES NORTH OF WEST YELLOWSTONE. FWQA STA. YP-47			
293018	GALLATIN R. AT WEST PARK BOUND.	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
	ON GALLATIN RIVER AT THE WEST PARK BOUNDARY, 30.0 MI. NORTH OF WEST YELLOWSTONE ON US-191 IN GALLATIN CO., MONTANA. TAKE SAMPLE FROM STREAM BANK. FWQA STA YP-48 LAT 4502555 11108460 LONG			
293019	MADISON RIVER NEAR WEST ENTRANCE	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
	ON MADISON RIVER 1.5 MI. EAST OF WEST YELLOWSTONE ON THE WEST ENTRANCE ROAD IN GALLATIN COUNTY, MONTANA. TAKE SAMPLE FROM LEFT BANK AT RIVERSIDE. SW 1/4 SEC 36, T135, R5E, FWQA STA YP-49 LAT 4439200 11104000 LONG FLOWS FOR THIS STATION FROM USGS 6-0375			
293020	BEAR CR MINE SPOIL SPILLS	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
	BEAR CREEK ABOVE MINE SPOIL PILES AT JARDINE IN PARK COUNTY, MONTANA FWQA - YP-103			
293021	BEAR CR BELOW MINE SPOIL PILES	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
	BEAR CREEK BELOW MINE SPOIL PILES NEAR JARDINE IN PARK COUNTY, MONTANA FWQA YP-104			
293022	ACID MINE ABOVE COOKE CITY	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER
	ACID MINE DRAINAGE SEEP WATER FROM MCLAREN MINE TAILINGS AREA ON SODA BUTTE CREEK ABOVE COOKE CITY, PARK CO., MONT., FWQA - ML-2			

STORET NUMBER	STATION NAME	STATE	MAJOR BASIN	MINOR BASIN	DESCRIPTION
293023	ACID MINE DRAINAGE DISCHARGE	MONTANA	MISSOURI RIVER	YELLOWSTONE RIVER	ACID MINE DRAINAGE DISCHARGE WATER FROM MCLAREN MINE TAILINGS AREA ON SODA BUTTE CREEK NEAR OLD SODA BUTTE CHANNEL, PARK CO., MONT., FWQA ML3
571000	SODA BUTTE CREEK AT PARK BOUN.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON SODA BUTTE CREEK AT THE PARK BOUNDARY IN YELLOWSTONE NATIONAL PARK, WYOMING TO REACH SAMPLE COLLECTION POINT GO .125 MILES SOUTH OF N.E. ENTRANCE STATION TO THE NORTH BANK OF THE STREAM. FWQA STA YP-15, SB-7
571001	SODA BUTTE CREEK NEAR MOUTH	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	AT SODA BUTTE CREEK 4.5 MI. ABOVE LAMAR RIVER CONFLUENCE IN YELLOWSTONE N.P., WYO. THE COLLECTION POINT IS ON THE WEST BANK OF THE STREAM AT THE END OF THE FOOT TRAIL FROM TROUT LAKE PARKING LOT. FWQA STA YP-8, SB-8
571002	LAMAR RIVER ABOVE MOUTH	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	LAMAR R 50 YDS UPSTREAM FROM CONFLUENCE WITH YELLOWSTONE R IN YELLOWSTONE NATIONAL PARK, WYO., BSF&W SAMPLE STA LA-1 ANALYSED BY FWQA LAT 4456000 11024000 LONG
571003	LAMAR RIVER NEAR MOUTH	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON LAMAR RIVER ABOVE CONFLUENCE WITH YELLOWSTONE RIVER IN YELLOWSTONE NATIONAL PARK, WYO. TO REACH THE SAMPLE COLLECTION POINT GO 50 YARDS UPSTREAM ON THE NORTH BANK FROM THE BRIDGE AT THE HIGHWAY CROSSING ON NORTHEAST ENTRANCE ROAD. IT MAY BE REACHED BY FOOT TRAIL FROM THE PARKING LOT AT THE BRIDGE. FWQA STA YP-6, LA-2 LAT 4454390 11019240 LONG USE FLOWS FOR USGS STATION 6-1880
571004	YELLOWSTONE R. AT FISHING BRIDGE	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON YELLOWSTONE RIVER AT FISHING BRIDGE IN TETON COUNTY, WYOMING. TAKE GRAND LOOP ROAD TO THE FISHING BRIDGE AND GO TO THE WEST BANK ON THE UPSTREAM SIDE TO REACH COLLECTION POINT. USGS STATION 6-1865 LOCATED ON BRIDGE AT RIVER MILE 5)4.8 FWQA STA YP-23, YS-1.
571005	GARDINER RIVER BELOW MAMMOTH	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON GARDINER RIVER 1.5 MILES BELOW MAMMOTH, PARK CO., WYO. THE SAMPLE COLLECTION POINT CAN BE REACHED BY DRIVING 1.5 MILES NORTH OF MAMMOTH ON THE NORTH PARK ENTRANCE ROAD AND WALKING 400 FEET UPSTREAM FROM THE HIGHWAY BRIDGE ON THE LEFT BANK. USGS STREAM STATION 6-1910 LOCATED AT THIS SITE. FWQA STA YP-3 LAT 4559350 11041250 LONG
571006	GARDINER RIVER ABOVE MAMMOTH	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON GARDINER RIVER AT THE BRIDGE 7.9 MILES UPSTREAM FROM THE MAMMOTH AREA IN PARK CO., WYOMING. THE SAMPLE COLLECTION POINT CAN BE REACHED FROM THE BRIDGE ON GRAND LOOP ROAD. FWQA STA YP-3.5 LAT 4457240 11040470 LONG

STORET NUMBER	STATION NAME	STATE	MAJOR BASIN	MINOR BASIN	DESCRIPTION
571007	LAVA CREEK LAVA CREEK PICNIC G	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	AT THE GRAND LOOP CROSSING AT LAVA CREEK PICNIC GROUND IN PARK CO., WYO. 4.6 MILES OUT THE GRAND LOOP ROAD FROM MAMMOTH TOWARD TOWER JUNCTION. SAMPLE FROM BRIDGE. FWQA STA YP-6
571008	SLOUGH CREEK ABOVE CAMPGROUND	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON SLOUGH CREEK ABOVE THE SLOUGH CREEK CAMPGROUND IN PARK CO., WYO. SAMPLE POINT IS ON THE BANK AT THE UPSTREAM EDGE OF THE CAMPGROUND AREA FWQA STA YP-7 LAT 4456440 11018180 LONG
571009	SLOUGH CREEK BELOW CAMPGROUND	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON SLOUGH CREEK BELOW THE SLOUGH CREEK CAMPGROUND IN PARK COUNTY, WYO. THE SAMPLE POINT IS ON THE BANK AT THE DOWNSTREAM EDGE OF THE CAMPGROUND AREA. FWQA STA YP-7.5 LAT 4456460 11018090 LONG
571010	LAMAR R. ABOVE SODA BUTTE INFLOW	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON THE LAMAR RIVER ABOVE THE INFLOW FROM SODA BUTTE CREEK IN PARK CO., WYOMING. TO REACH SAMPLE COLLECTION POINT, WADE SODA BUTTE CREEK MOUTH ON N.E. ENTRANCE HWY. ACCESSIBLE WITH DIFFICULTY ONLY. FWQA STA YP-16
571011	YELLOWSTONE R. AT TOWER JUNCTION	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON THE YELLOWSTONE RIVER ONE MILE NORTHEAST OF THE TOWER JUNCTION HWY. BRIDGE ON THE N.E. ENTRANCE HWY. IN YELLOWSTONE N. P. WYOMING. FWQA STA YP-17
571012	TOWER CR. NEAR TOWER FALLS	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON TOWER CREEK 2.4 MILES SOUTHEAST OF TOWER JUNCTION IN PARK CO., WYO. SAMPLE POINT IS AT GRAND LOOP ROAD BRIDGE BELOW TOWER FALLS CAMPGROUND. FWQA STA YP-18
571013	YELLOWSTONE R. AT THE UPPER FALL	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON THE YELLOWSTONE RIVER AT THE UPPER FALLS IN THE CANYON VILLAGE AREA, PARK CO., WYOMING. SAMPLE ABOVE FALLS. FWQA STA YP-20
571014	YELLOWSTONE R. IN HAYDEN VALLEY	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON YELLOWSTONE RIVER IN HAYDEN VALLEY, PARK COUNTY, WYOMING. TO REACH WALK IN FROM GRAND LOOP HIGHWY TROUT CREEK- SAMPLE ABOVE CREEK. FWQA STA YP-21
571015	YELLOWSTONE R. BELOW FISHING BR.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON YELLOWSTONE RIVER ABOUT 1.5 MILES BELOW FISHING BRIDGE IN PARK CO., WYOMING. TAKE GRAND LOOP ROAD AND MEASURE DISTANCE FROM FISHING BRIDGE BY CAR ODOMETER. PICK SPOT ON BANK FOR EASY ACCESS. FWQA STA YP-22
571016	PELICAN CREEK NEAR MOUTH	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	ON PELICAN CREEK NEAR MOUTH IN PARK CO., WYOMING. TO REACH SAMPLE COLLECTION POINT GO 1.4 MILES EAST OF FISHING BRIDGE ON EAST ENTRANCE ROAD AND SAMPLE AT ROAD BRIDGE. FWQA STA YP-24

STORET NUMBER	STATION NAME	STATE	MAJOR BASIN	MINOR BASIN
		DESCRIPTION		
571017	YELLOWSTONE LAKE IN BRIDGE BAY	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER SAMPLE AT BRIDGE ENTRANCE TO BRIDGE BAY MARINA. FWQA STA YP-25
571018	YELLOWSTONE LAKE NEAR DOT ISLAND	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER ON YELLOWSTONE LAKE NEAR DOT ISLAND IN TETON CO., WYOMING. BOAT STATION FWQA STA. YP-27
571019	YELLOWSTONE L. INLET TO W. THUMB	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER BOAT TO CENTER OF LINE FROM BREEZE POINT TO PUMICE POINT. DURING MAY. SAMPLES COLLECTED BY CHOPPING THROUGH ICE APPROX 100 YDS OFFSHORE FWQA STA. YP-28
571020	YELLOWSTONE L. IN MARY BAY AREA	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER ON YELLOWSTONE LAKE IN MARY BAY AREA IN TETON COUNTY, WYOMING. TAKE EAST ENTRANCE ROAD TO VICINITY OF HOLMES POINT AND SAMPLE FROM BANK. FWQA STA YP-29
571021	YELLOWSTONE L. IN FLAT MT. ARM	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER ON YELLOWSTONE LAKE IN FLAT MOUNTAIN ARM IN TETON CO., WYOMING. USE BOAT TO REACH SAMPLE POINT. FWQA STA YP-30
571022	YELLOWSTONE L. AT SOUTH ARM	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER ON YELLOWSTONE LAKE AT SOUTH ARM IN TETON COUNTY, WYOMING. TAKE A BOAT TO REACH SAMPLE COLLECTION POINT. FWQA STA YP-31
571023	YELLOWSTONE LAKE AT S. EAST ARM	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER ON YELLOWSTONE LAKE AT THE SOUTHEAST ARM IN TETON CO., WYOMING. TAKE A BOAT TO REACH SAMPLE COLLECTION POINT. FWQA STA YP-32
571024	YELLOWSTONE L WHERE RIVER ENTERS	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER ON YELLOWSTONE LAKE AT ENTRANCE OF RIVER INTO LAKE IN TETON, CO., WYO. TAKE A BOAT TO SAMPLE COLLECTION POINT. FWQA STA YP-33
571025	YELLOWSTONE L. NEAR GRANT V. STP	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER ON YELLOWSTONE LAKE NEAR GRANT VILLAGE STP EFFLUENT IN TETON CO., WYO. TAKE BOAT TO REACH SAMPLE COLLECTION POINT. APPROX. 100' OFF OUTFALL MANHOLE ON BANK. FWQA STA YP-34
571026	YELLOWSTONE L. NEAR WEST THUMB	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER ON YELLOWSTONE LAKE NEAR THE WEST THUMB AREA IN TETON CO., WYOMING. SAMPLE ABOUT 100' OFFSHORE FROM UNNAMED CREEK SOUTH OF PAINTPOTS. THE SOUTH ENTRANCE ROAD. FWQA STA YP-36
571027	DUCK LAKE NR W. THUMB CAMP GR.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER ON DUCK LAKE NEAR THE WEST THUMB CAMPGROUND IN TETON CO., WYOMING. IT IS THE AREA WATER SUPPLY. WALK IN FROM GRAND LOOP ROAD. FWQA STA YP-37

STORET NUMBER	STATION NAME	STATE	MAJOR BASIN	MINOR BASIN
	DESCRIPTION			
571036	MADISON R BELOW MADISON JUNC. CG	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	ON THE MADISON RIVER BELOW THE MADISON JUNCTION CAMPGROUND IN TETON COUNTY, WYOMING. SAMPLE FROM BANK AT FIRST TURNOUT ON WEST ENTRANCE ROAD WEST OF CAMPGROUND AREA. FWQA STA YP-50			
571037	GIBBON R. NEAR FIREHOLE R. JUNC.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	ON GIBBON RIVER NEAR ITS JUNCTION WITH THE FIREHOLE RIVER IN TETON CO., WYOMING. TAKE THE GRAND LOOP ROAD TO THE BRIDGE SOUTH OF THE AMPHI-THEATER TO REACH THE SAMPLE COLLECTION POINT. FWQA STA YP-52			
571038	GIBBON R. AT GIBBON R. RAPIDS	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	ON THE GIBBON RIVER AT THE GIBBON RIVER RAPIDS IN PARK CO., WYOMING. TAKE SAMPLE FROM BANK AT THE SIDE OF GRAND LOOP ROAD FWQA STA YP-53			
571039	GIBBON RIVER BELOW NORRIS CAMPGR	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	ON THE GIBBON RIVER AT BRIDGE JUST BELOW NORRIS CAMPGROUND. PARK CO., WYOMING. FWQA STA YP-54			
571040	FIREHOLE R. AT MADISON JUNCTION	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	ON FIREHOLE RIVER AT MADISON JUNCTION IN TETON CO., WYOMING. TAKE SAMPLE FROM BANK OFF FIREHOLE LOOP ROAD. FWQA STA YP-55			
571041	FIREHOLE R. BELOW LITTLE FIRE R.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	ON FIREHOLE RIVER JUST BELOW CONFLUENCE WITH THE LITTLE FIREHOLE RIVER IN TETON COUNTY, WYOMING. TAKE SAMPLE FROM BANK AT GRAND LOOP ROAD TURNOUT .4 MI. BELOW SAPPHIRE POOL. FWQA STA YP-56.5			
571042	FIREHOLE R. NEAR KEPLER CASCADES	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	ON FIREHOLE RIVER NEAR KEPLER CASCADES IN TETON CO., WYOMING. TAKE SAMPLE AT BRIDGE CROSSING ON GRAND LOOP ROAD AT THE S.E. EDGE OF THE OLD FAITHFUL AREA. FWQA STA YP-57			
571043	SYLVAN LAKE AT EAST ENTRANCE RD.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	ON SYLVAN LAKE AT EAST ENTRANCE ROAD 9.6 MI. WEST OF EAST ENTRANCE IN PARK CO., WYOMING. TAKE SAMPLE FROM BANK. FWQA STA YP-58			
571044	MIDDLE CR. AT EAST PARK BOUNDARY	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	ON MIDDLE CREEK AT EAST PARK BOUNDARY AT EAST ENTRANCE ROAD IN PARK COUNTY, WYOMING. TAKE SAMPLE FROM BANK. FWQA STA YP-59			
571045	GRANT VILLAGE STP EFFLUENT	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	AT THE GRANT VILLAGE SEWAGE TREATMENT PLANT IN TETON CO., WYOMING. FWQA STA YP-35			
571046	BRIDGE BAY S.T.P.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER
	BY BRIDGE BAY SEWAGE TREATMENT PLANT IN TETON CO., WYOMING. COLLECT INFLUENT AND EFFLUENT SAMPLES AT THIS STATION. FWQA STA YP-26			

STORET NUMBER	STATION NAME	STATE	MAJOR BASIN	MINOR BASIN	DESCRIPTION
571047	LOST CR BELOW ROOSEVELT LODGE	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	LOST CREEK AT GRAND LOOP ROAD BRIDGE BELOW ROOSEVELT LODGE IN PARK COUNTY, WYOMING, FWQA - YP- 18.5
571048	YELLOWSTONE L. NR STEVENSON IS.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	YELLOWSTONE LAKE ABOUT MIDWAY ON A LINE BETWEEN STEVENSON ISLAND & GULL POINT, TETON CO., WYO., FWQA - YP-27.5
571049	GARD. R AT MAMMOTH AREA INCEN.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	GARDINER RIVER AT MAMMOTH AREA INCINERATOR, PARK CO., WYO., FWQA YP-3.4
571050	GARDINER R. ABOVE MAMMOTH	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	GARDINER RIVER ABOVE MAMMOTH AT MAMMOTH TO TOWER ROAD BRIDGE, PARK CO., WYO., FWQA - YP-3.6
571051	SERVICE RD 1.2 MI S OF FISH. BR.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	YELLOWSTONE LAKE AT SERVICE ROAD 1.2 MILES SOUTH OF FISHING BRIDGE IN TETON COUNTY, WYOMING, FWQA - YP-23.5
571052	YELLOWSTONE L. S OF FISH. BR.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	YELLOWSTONE LAKE AT TURNOUT 2.3 MILES SOUTH OF FISHING BRIDGE, TETON CO. WYO., FWQA - YP-23.8
571053	YELLOWSTONE L. E. OF FISH. BR.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	YELLOWSTONE LAKE AT EAST EDGE OF SQUAW LAKE 3.3 MILES EAST OF FISHING BRIDGE, TETON CO., WYO., FWQA - YP-24.5
571054	YELLOWSTONE L. S. OF FISH. BR.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	YELLOWSTONE LAKE AT TURNOUT NEAR GULL POINT DRIVE 5.8 MILES SOUTH OF FISHING BRIDGE, TETON CO., WYO., FWQA - YP-25.5
571055	YELLOWSTONE L. S. OF FISH. BR.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	YELLOWSTONE LAKE AT TURNOUT 16.1 MILES SOUTH OF FISHING BRIDGE, TETON CO WYO., FWQA - YP-28.5
571056	YELLOWSTONE L. E OF FISH. BR.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	YELLOWSTONE LAKE AT BOAT LAUNCH AREA-7.2 MILES EAST OF FISHING BRIDGE TETON CO., WYO., FWQA-YP-29.5
571057	MADISON R. W. OF MADISON JCT.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	MADISON RIVER AT WEST ENTRANCE ROAD CROSSING ABOUT 5 MILES WEST OF MADISON JUNCTION IN TETON COUNTY, WYOMING, FWQA - YP-49.5
571058	GIBBON AT UPPER END OF ELK PARK	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	GIBBON RIVER AT UPPER END OF ELK PARK, JUST BELOW NORRIS CAMPGROUND AREA IN PARK COUNTY, WYOMING, FWQA - YP-53.5

STORET NUMBER	STATION NAME	STATE	MAJOR BASIN	MINOR BASIN	DESCRIPTION
571059	GIBBON R UPSTM FRM NORRIS CAMP.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	GIBBON RIVER AT BRIDGE ON CANYON TO NORRIS ROAD JUST UPSTREAM OF THE NORRIS CAMPGROUND IN PARK COUNTY, WYOMING. FWQA - YP-54.5
571060	FIREHOLE R AT BRIDGE	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	FIREHOLE RIVER AT BRIDGE JUST NORTH OF OLD FAITHFUL AREA, TETON CO., WYO., FWQA- YP-56.8
571061	FIREHOLE RIVER AT SERVICE ROAD	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	FIREHOLE RIVER AT SERVICE ROAD AT OLD FAITHFUL WATER SUPPLY DAM, TETON CO., WYO., FWQA - YP-57.5
571062	IRON SPR. CR BLW OLD FATH LAGOON	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	IRON SPRING CREEK BELOW OLD FAITHFUL LAGOONS, TETON CO., WYO., FWQA YP-57.7
571063	IRON SP CR ABOVE OLD FAITH LAGN	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	IRON SPRING CREEK ABOVE OLD FAITHFUL LAGOONS, TETON CO., WYO., FWQA YP-57.8
571064	CANYON VILLAGE STP INF. AND EFF.	WYOMING	MISSOURI RIVER	YELLOWSTONE RIVER	CANYON VILLAGE STP-INFLUENT AND EFFLUENT, PARK CO., WYO., FWQA - YP 19.5
571992	HEART LAKE OUTLET	WYOMING	PACIFIC NORTHWEST	COLUMBIA	AT THE HEART LAKE OUTLET IN TETON CO., WYOMING. WALK IN-COLLECTION BY NPS. FWQA YP-46
571993	SHOSHONE LAKE NEAR PATROL CABIN	WYOMING	PACIFIC NORTHWEST	COLUMBIA	ON SHOSHONE LAKE NEAR PATROL CABIN IN TETON CO., WYOMING. WALK IN TO SAMPLE POINT-COLLECTION BY NPS. FWQA STA YP-45
571994	LEWIS LAKE AT INLET TO LAKE	WYOMING	PACIFIC NORTHWEST	COLUMBIA	ON LEWIS LAKE AT INLET TO LAKE IN TETON CO., WYOMING. FWQA STA YP-44
571995	LEWIS LAKE AT LEWIS L. CAMP AREA	WYOMING	PACIFIC NORTHWEST	COLUMBIA	ON LEWIS LAKE AT LEWIS LAKE CAMPGROUND IN TETON CO., WYOMING. SAMPLE BY WADING INTO LAKE. FWQA STA YP-43
571996	LEWIS R AT S. ENTRANCE RD BRDGE	WYOMING	PACIFIC NORTHWEST	COLUMBIA	ON THE LEWIS RIVER AT THE SOUTH ENTRANCE ROAD BRIDGE CROSSING 10.4 MI. NORTH OF SOUTH ENTRANCE ON SOUTH ENTRANCE ROAD IN TETON CO., WYOMING. SAMPLE AT BRIDGE. FWQA STA YP-42
571997	SNAKE R. ABOVE LEWIS R. JUNC.	WYOMING	PACIFIC NORTHWEST	COLUMBIA	ON SNAKE RIVER ABOVE ITS JUNCTION WITH THE LEWIS RIVER IN TETON CO., WYOMING. WALK TO SAMPLE COLLECTION POINT FROM THE SOUTH ENTRANCE RANGER STATION. ACCESSIBLE ONLY WITH DIFFICULTY. FWQA STA YP-41
571998	SNAKE R. AT SOUTH PARK BOUNDARY	WYOMING	PACIFIC NORTHWEST	COLUMBIA	ON SNAKE RIVER AT THE SOUTH PARK BOUNDARY ON US-89 AT THE SOUTH ENTRANCE RANGER STATION IN TETON CO., WYOMING. FWQA STA. YP-40

APPENDIX C

Automatic Monitor Operation

A Schneider Instrument Company Model RM-25 Robot Water Quality Monitor was mounted in a 3/4 ton carryall type vehicle provided with pumps and generators for completely independent operation at selected locations in conjunction with field data collection efforts.

The Robot Monitoring equipment was used at five predetermined locations throughout the study area to record the diurnal effect, if any, over a forty-eight hour period to assist in evaluating other biological and chemical data. The parameters recorded were temperature, conductivity, dissolved oxygen and pH.

A brief description of each location, pump placement and weather conditions during the recording time is listed below:

Site 1

This location was on the south side of West Thumb near Grant Village, approximately one-half mile west of the STP discharge. This site was as close to the discharge as the vehicle could get because of the terrain along the lake shore. The chemical and microbiological analyses for this area are at Station 571026.

A submersible pump was rigged with a float and anchored about eighty feet offshore. Water depth at this point was ten to twelve feet. The pump intake was eighteen inches below the surface. Floats were taped to the intake hose and electric cable at fifteen foot intervals back to the shore.

Operation of the monitor began at 1200, July 9, 1970. Data recording was from 1800, July 9, 1970, to 1600, July 11, 1970. The weather conditions during the recording time were overcast with intermittent rain.

The Lake surface in this area was partly covered with pine pollen but seemed to have no ill effects except for appearance.

Site 2

This location was at the west end of Fishing Bridge (571004), about 0.2 of a mile downstream from the Lake on the Yellowstone River. The River at this point was approximately 300 feet wide with a channel depth of about ten feet.

The pump was hung from the bridge, on a cable, about 100 feet from the bank with the pump intake eighteen inches below the surface. The intake hose and power cable was taped to the railing.

Recording time was from 1900, July 11, 1970, to 0700, July 14, 1970. The weather conditions varied from cloudy to overcast with sleet and rain showers to clear and calm.

Site 3

The Firehole River location (571041) was in Bisquit Basin about two miles below the activity in the Old Faithful Area. A footbridge, leading to a large geyser, crossed the River 200 feet below the confluence of the Little Firehole and West Fork Rivers. At this point the River was approximately sixty feet wide and two to three feet deep. A pump was anchored with a cable near the center of the bridge with the intake one foot below the water surface. Some record was lost during the night of July 17, 1970, because algae accumulated on the pump screen stopping the flow to the monitor. The pump was moved to the downstream side of a bridge piling and operated one extra day with no problem.

During the day, the turbidity in the River would change rapidly, caused by a road construction project about one-half mile upstream. Weather conditions during this recording period were clear and calm.

A large amount of the River flow appeared to be from the geyser water entering along the banks of the two tributaries and the main stream.

Data collected at this point was from 1000, July 15, 1970, to 0900, July 18, 1970.

Site 4

This location was near the west entrance of the Park on the Madison River (293019). The site was at a U.S.G.S. gage station about one mile east of the Park entrance on a service road. This segment of the River averaged approximately 150 feet wide and 2 to 2.5 feet deep, with an estimated velocity of three feet/second. A submersible pump was anchored on some rocks in the main flow, about eighteen feet from the bank.

Weather conditions during the recording period were clear and calm. The chart data covered a period from 1200, July 18, 1970, to 1300, July 20, 1970.

Site 5

The final location was near the north entrance to the Park on the Gardner River (571005). This site was about 2.5 miles above the confluence with the Yellowstone River.

The stream at this point was estimated to be forty feet wide with an average depth of three feet. The pump was placed in the main channel and anchored to rocks with the intake one foot below the surface. Water velocity was estimated to be five or six feet/second.

Weather conditions during the recording time varied from clear to cloudy with rain.

Data recorded was from 1800, July 20, 1970, to July 22, 1970.

Recorded parameter values from each location were taken at four hour intervals from each chart and are presented in Tables C-1 through C-5. The tables are also shown in graph form.

The West Thumb and Yellowstone River locations indicated very little change in the parameters during a twenty-four hour period. Slight changes attributable to rainfall periods were recorded but due to the high dilution available for wastes discharged to the streams, no biological responses were noted.

Some trouble was encountered periodically in the electrical circuit of the temperature parameter. During the day, several checks were made with a thermometer to keep the data as reliable as possible.

Because of the time spent in close surveillance of the unit at each location, the data collected is reliable and useful in evaluating the water quality at the monitoring locations.

TABLE C-1

GARDNER RIVER - YELLOWSTONE PARK

Date	Time MST	Water Temp. °F	Cond. µmhos	DO mg/l	pH	Remarks
7/20/70	1800	71.5	460	7.2	7.30	Clear,
	2200	67.5	465	7.1	7.30	calm
7/21/70	0200	65.0	470	7.2	7.30	Cloudy,
	0600	61.5	470	7.5	7.30	light
	1000	62.5	460	7.8	7.35	rain
	1400	70.0	470	7.5	7.35	
	1800	68.5	475	7.2	7.35	
	2200	64.5	460	7.4	7.35	
7/22/70	0200	--	450	7.6	7.35	Cloudy,
	0600	57.5	455	7.9	7.38	rained
	1000	58.5	455	8.0	7.40	during
	1400	64.0	455	7.8	7.40	night and
	1730	63.5	450	7.8	7.40	most of day

TABLE C-2

MADISON RIVER - YELLOWSTONE PARK

Date	Time MST	Water Temp. °F	Cond. µmhos	DO mg/l	pH	Remarks
7/18/70	1200	73.0	425	6.9	7.80	Clear,
	1600	77.5	435	6.8	7.95	calm
	2000	75.5	445	6.8	8.00	
	2400	--	445	6.4	7.80	
7/19/70	0400	68.5	440	6.4	7.70	Clear,
	0800	68.0	440	6.8	7.75	calm
	1200	74.5	445	7.0	7.90	
	1600	77.0	440	6.9	8.00	
	2000	72.0	445	6.8	8.00	
	2400	68.0	440	6.4	7.80	
7/20/70	0400	65.5	440	6.5	7.75	Clear,
	0800	--	440	7.0	7.80	calm
	1200	72.5	445	7.0	7.90	
	1300	75.0	445	7.1	7.95	

TABLE C-3

FIREHOLE RIVER - YELLOWSTONE PARK

Date	Time MST	Water Temp. °F	Cond. µmhos	DO mg/l	pH	Remarks
7/15/70	1000	63.0	280	7.8	7.90	Partly
	1400	74.0	280	7.7	8.13	cloudy,
	1800	77.5	280	7.1	8.05	light
	2200	70.0	280	6.0	7.55	wind
7/16/70	0200	64.0	290	6.1	7.45	Partly
	0600	61.0	280	-	7.45	cloudy,
	1000	65.5	295	7.7	7.80	calm
	1400	75.5	280	7.7	8.10	
	1800	76.5	285	6.9	8.10	
	2200	--	-	-	--	
7/17/70	0200	--	-	-	--	Algae covering pump intake
	0600	--	-	-	--	
	1000	69.0	270	8.0	7.90	Readings during serv.
	1400	75.0	280	7.7	8.05	Partly
	1800	78.0	280	7.1	8.05	cloudy,
	2200	--	285	6.0	7.50	windy
7/18/70	0200	68.5	290	6.0	7.45	
	0600	64.0	275	6.3	7.40	Clear,
	0900	66.5	300	7.4	7.80	calm

TABLE C-4

FISHING BRIDGE - YELLOWSTONE PARK

Date	Time MST	Water Temp. °F	Cond. µmhos	DO mg/l	pH	Remarks
7/11/70	1900	57.5	105	8.0	7.35	Cloudy
	2300	56.5	105	7.8	7.30	
7/12/70	0300	56.0	105	7.7	7.20	Rain
	0700	57.5	110	7.6	7.30	showers,
	1100	60.0	115	7.8	7.35	some
	1500	61.0	110	7.9	7.45	sleet
	1900	60.0	115	8.1	7.45	
	2300	57.5	110	8.0	7.40	
7/13/70	0300	--	110	8.3	7.40	Rain
	0700	54.0	115	8.5	7.35	showers
	1100	56.0	110	8.0	7.30	
	1500	57.5	115	7.9	7.40	
	1900	58.5	110	7.9	7.55	
	2300	56.5	115	8.1	7.45	
7/14/70	0300	--	110	8.1	7.35	Clear,
	0700	54.5	110	8.0	7.35	calm

TABLE C-5

YELLOWSTONE LAKE - WEST THUMB

Date	Time MST	Water Temp. °F	Cond. µmhos	DO mg/l	pH	Remarks
7/9/70	1800	56.5	110	8.6	7.60	Cloudy,
	2200	55.0	110	8.4	7.55	calm
7/10/70	0200	54.0	110	8.2	7.55	Rain
	0600	55.0	110	8.2	7.50	and fog
	1000	55.0	110	8.3	7.55	
	1400	57.0	115	8.3	7.50	
	1800	56.0	120	8.4	7.60	
	2200	--	115	8.5	7.55	
7/11/70	0200	--	115	8.5	7.50	Cloudy,
	0600	54.5	110	8.3	7.55	light
	1000	54.5	105	8.4	7.35	rain
	1400	55.0	110	8.6	7.30	
	1600	56.5	110	8.9	7.25	

APPENDIX D

Summary of Water Quality Data

STORET DATE 72/11/28

169996
44 10 10.0 111 22 30.0 2
WARM R AT WM. R. RR STATIONS
16 IDAHO
PACIFIC NORTHWEST
SNAKE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	1	12.0000					12.0000	12.0000	70/07/30	70/07/30
00020	AIR	TEMP	CENT	1	18.0000					18.0000	18.0000	70/07/30	70/07/30
00070	TURB	JKSN	JTU	1	.600000					.600000	.600000	70/07/30	70/07/30
00095	CNDUCTVY	AT 25C	MICROMHJ	1	117.000					117.000	117.000	70/07/30	70/07/30
00300	DO		MG/L	1	10.0000					10.0000	10.0000	70/07/30	70/07/30
00400	PH		SU	1	7.90000					7.90000	7.90000	70/07/30	70/07/30
00403	LAB	PH	SU	1	7.50000					7.50000	7.50000	70/07/30	70/07/30
00410	T ALK	CACO3	MG/L	1	44.0000					44.0000	44.0000	70/07/30	70/07/30
00500	RESIDUE	TOTAL	MG/L	1	139.000					139.000	139.000	70/07/30	70/07/30
00515	RESIDUE	DISS-105	C MG/L	1	99.0000					99.0000	99.0000	70/07/30	70/07/30
00610	NH3-N	TOTAL	MG/L	1	.000000					.000000	.000000	70/07/30	70/07/30
00625	TOT KJEL	N	MG/L	1	.300000					.300000	.300000	70/07/30	70/07/30
00630	NO2&NO3	N-TOTAL	MG/L	1	.040000					.040000	.040000	70/07/30	70/07/30
00665	PHOS-T	P-WET	MG/L	1	.030000					.030000	.030000	70/07/30	70/07/30
00680	T ORG C	C	MG/L	1	4.30000					4.30000	4.30000	70/07/30	70/07/30
00915	CALCIUM	CA,DISS	MG/L	1	7.70000					7.70000	7.70000	70/07/30	70/07/30
00925	MGNSIUM	MG,DISS	MG/L	1	2.00000					2.00000	2.00000	70/07/30	70/07/30
00930	SODIUM	NA,DISS	MG/L	1	13.0000					13.0000	13.0000	70/07/30	70/07/30
00935	PTSSIUM	K,DISS	MG/L	1	1.80000					1.80000	1.80000	70/07/30	70/07/30
00940	CHLORIDE	CL	MG/L	1	5.00000					5.00000	5.00000	70/07/30	70/07/30
00945	SULFATE	SO4	MG/L	1	5.00000					5.00000	5.00000	70/07/30	70/07/30
00950	FLUORIDE	F,DISS	MG/L	1	2.10000					2.10000	2.10000	70/07/30	70/07/30
00955	SILICA	DISOLVED	MG/L	1	41.0000					41.0000	41.0000	70/07/30	70/07/30
01005	BARIUM	BA,DISS	UG/L	1	.000000					.000000	.000000	70/07/30	70/07/30
01040	COPPER	CU-DISS	UG/L	1	.000000					.000000	.000000	70/07/30	70/07/30
01045	IRON	TOTAL	UG/L	1	.000000					.000000	.000000	70/07/30	70/07/30
01049	LEAD	PB,DISS	UG/L	1	.000000					.000000	.000000	70/07/30	70/07/30
01055	MANGNESE	MN	UG/L	1	.000000					.000000	.000000	70/07/30	70/07/30
01090	ZINC	ZN,DISS	UG/L	1	.000000					.000000	.000000	70/07/30	70/07/30
70507	PHOS-T	ORTHO	MG/L P	1	.000000					.000000	.000000	70/07/30	70/07/30

STORET DATE 72/11/24

169567
+4 10 10.0 111 29 35.5 2
SNAKE RIVER AT US-191 BRI
ID IDAHO
PACIFIC NORTHWEST
SNAKE RIVER
117MBR 77777777
0000

INDEX 1021300
MILES 1143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STANDER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	3	12.0667	24.3535	4.93230	.389439	2.84901	16.0000	7.00000	70/05/23	70/07/30
00020	AIR	TEMP	CENT	3	15.0000	67.0000	8.18535	.454742	4.72581	25.0000	8.00000	70/05/23	70/07/30
00070	TURB	JKSN	JTU	3	2.56667	8.90333	2.97714	1.15992	1.71855	6.00000	.700000	70/05/23	70/07/30
00095	CNDUCTVY	AT 25C	MICROMHO	3	122.667	316.352	17.7863	.144997	10.2658	143.000	110.000	70/05/23	70/07/30
00300	DO		MG/L	3	9.16666	.813522	.901955	.098395	.520744	10.1000	8.30000	70/05/23	70/07/30
00400	PH		SU	3	7.30000	.130056	.360689	.046242	.208244	8.10000	7.40000	70/05/23	70/07/30
00403	LAB	PH	SU	3	7.63667	.083405	.288759	.037669	.166758	8.00000	7.50000	70/05/23	70/07/30
00410	T ALK	CACO3	MG/L	3	54.0000	49.0000	6.92820	.128300	4.00000	62.0000	50.0000	70/05/23	70/07/30
00500	RESIDUE	TOTAL	MG/L	3	145.000	2107.00	45.9021	.316566	26.5016	187.000	96.0000	70/05/23	70/07/30
00515	RESIDUE	DISS-105	C MG/L	3	98.6667	329.348	18.1479	.183932	10.4777	118.000	82.0000	70/05/23	70/07/30
00610	NH3-N	TOTAL	MG/L	3	.010000	.000100	.010000	1.00000	.005773	.020000	.000000	70/05/23	70/07/30
00625	TOT KJEL	N	MG/L	3	.126667	.002033	.045093	.355995	.026034	.170000	.080000	70/05/23	70/07/30
00630	NO2&NO3	N-TOTAL	MG/L	3	.036667	.000833	.028866	.787297	.016667	.070000	.020000	70/05/23	70/07/30
00665	PHOS-T	P-TOT	MG/L	3	.036667	.000933	.030551	.833196	.017638	.070000	.010000	70/05/23	70/07/30
00680	T ORG C	C	MG/L	3	5.36666	3.22342	1.79539	.334545	1.03657	7.40000	4.00000	70/05/23	70/07/30
00915	CALCIUM	CA,DISS	MG/L	3	12.2333	17.6034	4.20279	.343552	2.42648	16.0000	7.70000	70/05/23	70/07/30
00925	MGNSIUM	MG,DISS	MG/L	3	3.20000	.909996	.953937	.298105	.550756	4.20000	2.30000	70/05/23	70/07/30
00930	SODIUM	NA,DISS	MG/L	3	8.76666	4.46343	2.11268	.240991	1.21976	11.0000	6.80000	70/05/23	70/07/30
00935	POTSSIUM	K,DISS	MG/L	3	1.93333	.013333	.115486	.059734	.066676	2.00000	1.80000	70/05/23	70/07/30
00940	CHLORIDE	CL	MG/L	3	3.00000	3.00000	1.73205	.577350	1.00000	5.00000	2.00000	70/05/23	70/07/30
00945	SULFATE	SO4	MG/L	3	7.23333	3.20340	1.78980	.247438	1.03334	9.30000	6.20000	70/05/23	70/07/30
00950	FLUO-IDE	F,DISS	MG/L	3	1.25000	.542501	.736547	.589238	.425246	1.90000	.450000	70/05/23	70/07/30
00955	SILICA	DISSLVED	MG/L	2	31.0000	2.00000	1.41421	.045620	1.00000	32.0000	30.0000	70/07/17	70/07/30
01005	BARIUM	BA,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/07/30
01040	COPPER	CU-DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/07/30
01045	IRON	TOTAL	UG/L	3	243.333	32433.4	180.093	.740107	103.977	450.000	120.000	70/05/23	70/07/30
01049	LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/07/30
01055	MANGNESE	MN	UG/L	3	16.6667	833.334	28.8675	1.73205	16.6667	50.0000	.000000	70/05/23	70/07/30
01090	ZINC	ZN,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/07/30
70507	PHOS-T	ORTHO	MG/L P	3	.008333	.000108	.010408	1.24900	.006009	.020000	.000000	70/05/23	70/07/30

STORET DATE 72/11/23

169998
44 06 25.2 111 20 10.0 2
FALLS R 2 MI W OF TARGHEE FOREST
16 IDAHO
PACIFIC NORTHWEST
SNAKE RIVER
1117MAR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER TEMP	CENT		2	9.75000	78.1250	8.83883	.906547	6.25000	16.0000	3.50000	70/05/23	70/07/17
00020	AIR TEMP	CENT		2	17.5000	112.500	10.6066	.606091	7.50000	25.0000	10.0000	70/05/23	70/07/17
00070	TURB JKSN	ITU		2	2.70000	6.48000	2.54558	.942809	1.80000	4.50000	.900000	70/05/23	70/07/17
00095	CNDUCTVY AT 25C	MICROMHO		2	87.0000	512.000	22.6274	.260085	16.0000	103.000	71.0000	70/05/23	70/07/17
00300	DO	MG/L		2	9.10000	.980026	.989963	.108787	.700010	9.80000	8.40000	70/05/23	70/07/17
00400	PH	SU		2	7.50000	.180008	.424273	.056570	.300007	7.80000	7.20000	70/05/23	70/07/17
00403	LAB PH	SU		2	7.10000	.179977	.424237	.059752	.299981	7.40000	6.80000	70/05/23	70/07/17
00410	T ALK CACO3	MG/L		2	31.5000	40.5000	6.36396	.202030	4.50000	36.0000	27.0000	70/05/23	70/07/17
00500	RESIDUE TOTAL	MG/L		2	124.500	1624.50	40.3051	.323736	28.5000	153.000	96.0000	70/05/23	70/07/17
00515	RESIDUE DISS-105	MG/L	C	2	100.000	3362.00	57.9828	.579828	41.0000	141.000	59.0000	70/05/23	70/07/17
00610	NH3-N TOTAL	MG/L		2	.035000	.001250	.035355	1.01015	.025000	.060000	.010000	70/05/23	70/07/17
00625	TOT KJEL N	MG/L		2	.480000	.423200	.650538	1.35529	.460000	.940000	.020000	70/05/23	70/07/17
00630	NO2&NO3 N-TOTAL	MG/L		2	.070000	.000200	.014143	.202038	.010000	.080000	.060000	70/05/23	70/07/17
00665	PHOS-T P-WET	MG/L		2	.025000	.000050	.007071	.282842	.005000	.030000	.020000	70/05/23	70/07/17
00680	T ORG C C	MG/L		2	4.25000	.405014	.636407	.149743	.450008	4.70000	3.80000	70/05/23	70/07/17
00915	CALCIUM CA,DISS	MG/L		2	5.65000	.845001	.919239	.162697	.650001	6.30000	5.00000	70/05/23	70/07/17
00925	MGNSIUM MG,DISS	MG/L		2	1.20000	-.953E-06	.000000		.000000	1.20000	1.20000	70/05/23	70/07/17
00930	SODIUM NA,DISS	MG/L		2	10.2500	6.12500	2.47487	.241451	1.75000	12.0000	8.50000	70/05/23	70/07/17
00935	POTSSIUM K,DISS	MG/L		2	1.90000	.320000	.565685	.297729	.400000	2.30000	1.50000	70/05/23	70/07/17
00940	CHLORIDE CL	MG/L		2	3.50000	4.50000	2.12132	.606092	1.50000	5.00000	2.00000	70/05/23	70/07/17
00945	SULFATE SO4	MG/L		2	5.55000	1.80501	1.34351	.242073	.950002	6.50000	4.60000	70/05/23	70/07/17
00950	FLUORIDE F,DISS	MG/L		2	1.30000	.720002	.848529	.652715	.600001	1.90000	.700000	70/05/23	70/07/17
00955	SILICA DISSOLVED	MG/L		1	26.0000					26.0000	26.0000	70/07/17	70/07/17
01005	BARIUM BA,DISS	UG/L		2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/07/17
01040	COPPER CU-DISS	UG/L		2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/07/17
01045	IRON TOTAL	UG/L		2	415.000	110450	332.340	.800819	235.000	650.000	180.000	70/05/23	70/07/17
01049	LEAD PB,DISS	UG/L		2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/07/17
01055	MANGNESE MN	UG/L		2	25.0000	1250.00	35.3553	1.41421	25.0000	50.0000	.000000	70/05/23	70/07/17
01090	ZINC ZN,DISS	UG/L		2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/07/17
70507	PHOS-T ORTHO	MG/L	P	2	.012500	.000112	.010607	.848528	.007500	.020000	.005000	70/05/23	70/07/17

START DATE 72/11/11

154-69
44 05 00.0 111 13 00.0 3
FALLS R. BELOW BECHLER R. JUNC
16 IDAHO
PACIFIC NORTHWEST
SNAKE
1117MBR 77777777
0000

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	13.2500	3.12500	1.76777	.133416	1.25000	14.5000	12.0000	70/07/17	70/07/30
00020	AIR	TEMP	CENT	2	21.0000	2.00000	1.41421	.067343	1.00000	22.0000	20.0000	70/07/17	70/07/30
00070	TURB	JKSN	JTU	2	.500000	.000000	.000000		.000000	.500000	.500000	70/07/17	70/07/30
00095	CNDUCTVY	AT 25C	MICROMHO	2	132.000	98.0000	9.89949	.074996	7.00000	139.000	125.000	70/07/17	70/07/30
00300	DO		MG/L	2	8.69999	.020203	.142136	.015970	.100505	9.00000	8.80000	70/07/17	70/07/30
00400	PH		SU	2	8.00000	.180008	.424273	.053034	.300007	8.30000	7.70000	70/07/17	70/07/30
00403	LAB	PH	SU	2	7.65000	.004990	.070637	.009234	.049948	7.70000	7.60000	70/07/17	70/07/30
00410	T ALK	CACO3	MG/L	2	43.0000	18.0000	4.24264	.098666	3.00000	46.0000	40.0000	70/07/17	70/07/30
00500	RESIDUE	TOTAL	MG/L	2	155.000	200.000	14.1421	.091240	10.0000	165.000	145.000	70/07/17	70/07/30
00515	RESIDUE	DISS-105	C MG/L	2	120.000	392.000	19.7990	.164992	14.0000	134.000	106.000	70/07/17	70/07/30
00610	NH3-N	TOTAL	MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
00625	TOT KJEL	N	MG/L	2	.030000	-.232E-09	.000000		.000000	.030000	.030000	70/07/17	70/07/30
00630	NO2&NO3	N-TOTAL	MG/L	2	.010000	-.145E-10	.000000		.000000	.010000	.010000	70/07/17	70/07/30
00665	PHOS-T	P-WET	MG/L	2	.010000	-.145E-10	.000000		.000000	.010000	.010000	70/07/17	70/07/30
00680	T ORG C	C	MG/L	2	5.65000	23.8050	4.87904	.834023	3.45000	9.30000	2.40000	70/07/17	70/07/30
00915	CALCIUM	CA,DISS	MG/L	2	3.55000	.005005	.070745	.017910	.050024	4.00000	3.90000	70/07/17	70/07/30
00925	MGNSIUM	MG,DISS	MG/L	1	.600000					.600000	.600000	70/07/30	70/07/30
00930	SODIUM	NA,DISS	MG/L	2	20.5000	4.50000	2.12132	.103479	1.50000	22.0000	19.0000	70/07/17	70/07/30
00935	PTSSIUM	K,DISS	MG/L	2	3.30000	.020004	.141436	.042860	.100011	3.40000	3.20000	70/07/17	70/07/30
00940	CHLORIDE	CL	MG/L	2	9.00000	2.00000	1.41421	.157135	1.00000	10.0000	8.00000	70/07/17	70/07/30
00945	SULFATE	SO4	MG/L	2	4.20000	.180008	.424273	.101017	.300007	4.50000	3.90000	70/07/17	70/07/30
00950	FLUORIDE	F,DISS	MG/L	2	2.95000	.244995	.494970	.167786	.349997	3.30000	2.60000	70/07/17	70/07/30
00955	SILICA	DISOLVED	MG/L	2	36.5000	12.5000	3.53553	.096864	2.50000	39.0000	34.0000	70/07/17	70/07/30
01005	BARIUM	BA,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
01040	COPPER	CU-DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
01045	IRON	TOTAL	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
01049	LEAD	PB,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
01055	MANGNESE	MN	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
01090	ZINC	ZN,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
70507	PHOS-T	ORTHO	MG/L P	2	.005000	.000050	.007071	1.41421	.005000	.010000	.000000	70/07/17	70/07/30

START DATE 72/11/28

293008
45 01 00.0 109 55 00.0 5
SODA BUTTE CR ABOVE MCLAREN MINE
00 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1217MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00070	TURB	JKSN	JTU	1	1.30000					1.30000	1.30000	69/05/17	69/05/17
00095	CNDUCTVY	AT 25C	MICROMHO	6	223.667	896.287	29.9381	.133851	12.2222	253.000	173.000	69/05/17	69/10/16
00400	PH		SU	7	7.12857	3.03914	1.74331	.244553	.658911	8.10000	3.20000	69/05/17	70/08/25
00410	T ALK	CACO3	MG/L	7	90.0000	1797.00	42.3910	.471011	16.0223	119.000	.000000	69/05/17	70/08/25
00435	T ACDITY	CACO3	MG/L	1	108.000					108.000	108.000	70/08/25	70/08/25
00515	RESIDUE	DISS-105	C MG/L	6	125.167	105.775	10.2847	.082168	4.19871	139.000	114.000	69/05/17	69/10/16
00620	NO3-N	TOTAL	MG/L	6	.050000	.004800	.069282	1.38564	.028284	.190000	.010000	69/05/17	69/10/16
00665	PHOS-T	P-WET	MG/L	6	.030000	.001240	.035214	1.17379	.014376	.100000	.010000	69/05/17	69/10/16
00720	CYANIDE	CN	MG/L	2	.010000	.000200	.014142	1.41421	.010000	.020000	.000000	69/09/19	69/10/16
00900	TOT HARD	CACO3	MG/L	6	108.600	198.550	14.0908	.129749	5.75253	122.000	84.7000	69/05/17	69/10/16
00915	CALCIUM	CA,DISS	MG/L	6	35.0000	20.8000	4.56070	.130306	1.86190	39.0000	27.0000	69/05/17	69/10/16
00925	MGNSIUM	MG,DISS	MG/L	6	6.48333	1.01768	1.00880	.155599	.411841	8.30000	5.40000	69/05/17	69/10/16
00930	SODIUM	NA,DISS	MG/L	6	1.13333	.026668	.163303	.144091	.066668	1.30000	.900000	69/05/17	69/10/16
00935	PTSSIUM	K,DISS	MG/L	6	.616666	.025667	.160210	.259800	.065405	.800000	.400000	69/05/17	69/10/16
00940	CHLORIDE	CL	MG/L	6	.216666	.041667	.204124	.942113	.083333	.600000	.000000	69/05/17	69/10/16
00945	SULFATE	SO4	MG/L	7	121.757	89451.6	299.085	2.45640	113.043	800.000	4.00000	69/05/17	70/08/25
01000	ARSENIC	AS,DISS	UG/L	2	20.0000	200.000	14.1421	.707107	10.0000	30.0000	10.0000	69/05/17	69/06/17
01040	COPPER	CU-DISS	UG/L	6	20.0000	.000000	.000000		.000000	20.0000	20.0000	69/05/17	69/10/16
01045	IRON	TOTAL	UG/L	7	13214.3	.120E+10	34741.3	2.62907	13131.0	92000.0	50.0000	69/05/17	70/08/25
01049	LEAD	PB,DISS	UG/L	6	200.000	.000000	.000000		.000000	200.000	200.000	69/05/17	69/10/16
01055	MANGNESE	MN	UG/L	6	16.6667	106.667	10.3280	.619679	4.21638	30.0000	10.0000	69/05/17	69/10/16
01090	ZINC	ZN,DISS	UG/L	6	98.3333	96.6726	9.83222	.099989	4.01399	110.000	80.0000	69/05/17	69/10/16
70507	PHOS-T	ORTHO	MG/L P	5	.014000	.000080	.008944	.638879	.004000	.030000	.010000	69/05/17	69/09/19
71900	MERCURY	HG,TOTAL	UG/L	1	.800000					.800000	.800000	70/08/25	70/08/25

STORET DATE 72/11/23

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CR. ABOVE MCLAREN MINE TAILINGS
00 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00070	TURB	JKSN	JTU	1	1.20000					1.20000	1.20000	69/05/17	69/05/17
00095	CNDUCTVY	AT 25C	MICROMHO	6	159.000	1503.20	38.7711	.243843	15.8282	212.000	120.000	69/05/17	69/10/16
00400	PH		SU	6	7.61666	.009717	.098574	.012942	.040243	7.30000	7.50000	69/05/17	69/10/16
00410	T ALK	CACO3	MG/L	6	55.6667	61.0703	7.81475	.140385	3.19036	65.0000	46.0000	69/05/17	69/10/16
00515	RESIDUE	DISS-105	C MG/L	6	92.5000	534.700	23.1236	.249985	9.44016	124.000	65.0000	69/05/17	69/10/16
00620	NO3-N	TOTAL	MG/L	6	.015000	.000030	.005477	.365150	.002236	.020000	.010000	69/05/17	69/10/16
00665	PHOS-T	P-WET	MG/L	6	.026667	.000507	.022509	.844097	.009189	.070000	.010000	69/05/17	69/10/16
00720	CYANIDE	CN	MG/L	2	.025000	.000050	.007071	.282842	.005000	.030000	.020000	69/09/19	69/10/16
00900	TOT HARD	CACO3	MG/L	6	70.8666	266.637	16.3290	.230419	6.66629	91.7000	54.7000	69/05/17	69/10/16
00915	CALCIUM	CA,DISS	MG/L	6	24.5000	27.5000	5.24404	.214043	2.14087	32.0000	19.0000	69/05/17	69/10/16
00925	MGNSIUM	MG,DISS	MG/L	6	3.06667	.418668	.647045	.210993	.264155	3.90000	2.00000	69/05/17	69/10/16
00930	SODIUM	NA,DISS	MG/L	6	.800000	.016000	.126493	.158116	.051640	.900000	.600000	69/05/17	69/10/16
00935	PTSSIUM	K,DISS	MG/L	6	.473333	.059467	.243858	.515194	.099555	.700000	.040000	69/05/17	69/10/16
00940	CHLORIDE	CL	MG/L	6	.183333	.033667	.183465	1.00083	.074907	.400000	.000000	69/05/17	69/10/16
00945	SULFATE	SO4	MG/L	6	22.1667	126.967	11.2680	.508330	4.60013	35.0000	7.00000	69/05/17	69/10/16
01000	ARSENIC	AS,DISS	UG/L	2	10.0000	.000000	.000000		.000000	10.0000	10.0000	69/05/17	69/06/17
01040	COPPER	CU-DISS	UG/L	6	20.0000	.000000	.000000		.000000	20.0000	20.0000	69/05/17	69/10/16
01045	IRON	TOTAL	UG/L	6	241.667	81416.6	285.336	1.18070	116.488	700.000	50.0000	69/05/17	69/10/16
01049	LEAD	PB,DISS	UG/L	6	200.000	.000000	.000000		.000000	200.000	200.000	69/05/17	69/10/16
01055	MANGNESE	MN	UG/L	6	10.0000	.000000	.000000		.000000	10.0000	10.0000	69/05/17	69/10/16
01090	ZINC	ZN,DISS	UG/L	6	98.3333	96.6726	9.83222	.099989	4.01399	110.000	80.0000	69/05/17	69/10/16
70507	PHOS-T	ORTHO	MG/L P	5	.014000	.000080	.008944	.638879	.004000	.030000	.010000	69/05/17	69/09/19

STORET DATE 72/1/23

293010
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CR. BELOW MCLAREN MINE TAILINGS
00 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00070	TURB	JKSN	JTU	1	63.0000					63.0000	63.0000	69/05/17	69/05/17
00095	CNDUCTVY	AT 25C	MICROMHO	6	304.500	10167.1	100.832	.331140	41.1645	416.000	170.000	69/05/17	69/10/16
00400	PH		SU	6	7.56666	.074756	.273415	.036134	.111621	7.80000	7.10000	69/05/17	69/10/16
00410	T ALK	CACO3	MG/L	6	71.3333	1196.67	34.5929	.484948	14.1225	114.000	39.0000	69/05/17	69/10/16
00515	RESIDUE	DISS-105	C MG/L	6	193.667	3189.39	56.4791	.291630	23.0575	252.000	115.000	69/05/17	69/10/16
00620	NO3-N	TOTAL	MG/L	6	.018333	.000057	.007528	.410605	.003073	.030000	.010000	69/05/17	69/10/16
00665	PHOS-T	P-WET	MG/L	6	.033333	.001147	.033862	1.01587	.013824	.100000	.010000	69/05/17	69/10/16
00720	CYANIDE	CN	MG/L	2	.020000	.000200	.014142	.707107	.010000	.030000	.010000	69/09/19	69/10/16
00900	TOT HARD	CACO3	MG/L	6	146.650	2324.42	48.2123	.328758	19.6826	203.400	86.7000	69/05/17	69/10/16
00915	CALCIUM	CA,DISS	MG/L	6	44.5000	165.100	12.8491	.288744	5.24563	58.0000	27.0000	69/05/17	69/10/16
00925	MGNSIUM	MG,DISS	MG/L	6	10.7333	11.6747	3.41683	.318338	1.39491	15.0000	5.80000	69/05/17	69/10/16
00930	SODIUM	NA,DISS	MG/L	6	1.08333	.101669	.318855	.294328	.130172	1.40000	.700000	69/05/17	69/10/16
00935	PTSSIUM	K,DISS	MG/L	6	1.05000	.183001	.427786	.407415	.174643	1.70000	.500000	69/05/17	69/10/16
00940	CHLORIDE	CL	MG/L	6	.300000	.092000	.303315	1.01105	.123828	.800000	.000000	69/05/17	69/10/16
00945	SULFATE	SO4	MG/L	6	78.3333	1341.87	36.6316	.467637	14.9548	136.000	42.0000	69/05/17	69/10/16
01000	ARSENIC	AS,DISS	UG/L	2	15.0000	50.0000	7.07107	.471404	5.00000	20.0000	10.0000	69/05/17	69/06/17
01040	COPPER	CU-DISS	UG/L	6	146.667	96266.6	310.269	2.11547	126.667	780.000	20.0000	69/05/17	69/10/16
01045	IRON	TOTAL	UG/L	6	5216.66	.219E+08	4680.35	.897192	1910.75	14000.0	1000.00	69/05/17	69/10/16
01049	LEAD	PB,DISS	UG/L	6	200.000	.000000	.000000		.000000	200.000	200.000	69/05/17	69/10/16
01055	MANGNESE	MN	UG/L	6	491.666	14017.0	118.393	.240800	48.3339	640.000	330.000	69/05/17	69/10/16
01090	ZINC	ZN,DISS	UG/L	6	131.667	1856.67	43.0892	.327259	17.5911	200.000	100.000	69/05/17	69/10/16
70507	PHOS-T	ORTHO	MG/L P	5	.028000	.001220	.034928	1.24745	.015620	.090000	.010000	69/05/17	69/09/19

START DATE 72/11/29

292011
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SODA BUTTE CR. AT COOKE CITY
00 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBK 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	11	3.54545	6.67273	2.58316	.728585	.778853	9.00000	1.00000	70/05/09	70/08/11
00020	AIR	TEMP	CENT	11	10.2273	34.2682	5.85390	.572382	1.76502	20.0000	3.00000	70/05/09	70/08/11
00060	STREAM	FLOW	CFS	1	.900000					.900000	.900000	70/05/16	70/05/16
00070	TURB	JKSN	JTU	5	34.0000	240.500	15.5081	.456119	6.93542	50.0000	16.0000	69/05/17	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	10	307.600	15009.5	122.513	.398287	38.7421	565.000	181.000	69/05/17	70/08/02
00300	DO		MG/L	4	8.74999	.203532	.451145	.051559	.225573	9.10000	8.10000	70/05/09	70/08/02
00310	BOD	3 DAY	MG/L	2	.650000	.045001	.212134	.326360	.150002	.800000	.500000	70/05/14	70/05/16
00400	BOD	5 DAY	MG/L	3	.400000	.000000	.000000		.000000	.400000	.400000	70/05/14	70/05/16
00400	PH		SU	10	7.54999	.078396	.279993	.037085	.088542	7.80000	7.10000	69/05/17	70/08/02
00403	LAB	PH	SU	7	7.23571	.028117	.167681	.023015	.063377	7.40000	7.00000	70/05/09	70/08/11
00410	T ALK	CACO3	MG/L	10	89.8000	649.965	25.4944	.283902	8.06204	142.000	62.0000	69/05/17	70/08/02
00500	RESIDUE	TOTAL	MG/L	4	319.000	7716.66	87.8445	.275375	43.9223	440.000	231.000	70/05/09	70/08/02
00515	RESIDUE	DISS-105	C MG/L	10	195.300	9111.35	95.4534	.488753	30.1850	426.000	103.000	69/05/17	70/08/02
00610	NH3-N	TOTAL	MG/L	4	.027500	.000158	.012583	.457567	.006292	.040000	.010000	70/05/09	70/08/02
00620	NO3-N	TOTAL	MG/L	6	.020000	.000040	.006325	.316230	.002582	.030000	.010000	69/05/17	69/10/16
00625	TOT KJEL	N	MG/L	4	.042500	.000025	.005000	.117651	.002500	.050000	.040000	70/05/09	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	4	.042500	.000825	.028723	.675832	.014361	.080000	.020000	70/05/09	70/08/02
00665	PHOS-T	P-WET	MG/L	10	.027000	.000846	.029078	1.07698	.009195	.100000	.000000	69/05/17	70/08/02
00680	T ORG C	C	MG/L	4	4.07500	18.6692	4.32079	1.06032	2.16039	9.70000	.300000	70/05/09	70/08/02
00720	CYANIDE	CN	MG/L	2	.015000	.000050	.007071	.471404	.005000	.020000	.010000	69/09/19	69/10/16
00900	TOT HARD	CACO3	MG/L	6	131.517	2758.41	52.5206	.399346	21.4414	209.000	72.6000	69/05/17	69/10/16
00915	CALCIUM	CA,DISS	MG/L	10	57.8000	1353.74	36.7931	.636560	11.6350	130.000	29.0000	69/05/17	70/08/02
00925	MGNSIUM	MG,DISS	MG/L	10	11.8300	34.5913	5.88144	.497163	1.85987	23.0000	5.80000	69/05/17	70/08/02
00930	SODIUM	NA,DISS	MG/L	10	1.20000	.080002	.282846	.235705	.089444	1.70000	.800000	69/05/17	70/08/02
00935	PTSSIUM	K,DISS	MG/L	10	1.14000	.271556	.521110	.457114	.164790	2.10000	.500000	69/05/17	70/08/02
00940	CHLORIDE	CL	MG/L	10	1.000000	1.95333	1.39762	1.39762	.441965	4.00000	.000000	69/05/17	70/08/02
00945	SULFATE	SO4	MG/L	10	71.7000	2868.68	53.7464	.749602	16.9961	210.000	24.0000	69/05/17	70/08/02
00950	FLUORIDE	F,DISS	MG/L	4	.050000	.010000	.100000	2.00000	.050000	.200000	.000000	70/05/09	70/08/02
00955	SILICA	DISOLVED	MG/L	2	7.50000	.500000	.707107	.094281	.500000	8.00000	7.00000	70/07/22	70/08/02
01000	ARSENIC	AS,DISS	UG/L	2	10.0000	.000000	.000000		.000000	10.0000	10.0000	69/05/17	69/06/17
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01040	COPPER	CU-DISS	UG/L	10	115.000	40205.6	200.513	1.74359	63.4078	600.000	.000000	69/05/17	70/08/02
01045	IRON	TOTAL	UG/L	10	13180.0	.653E+09	25566.5	1.93980	8084.84	85000.0	1600.00	69/05/17	70/08/02
01049	LEAD	PB,DISS	UG/L	10	120.000	10666.7	103.280	.860663	32.6598	200.000	.000000	69/05/17	70/08/02
01055	MANGNESE	MN	UG/L	10	361.000	59076.7	243.057	.673288	76.8613	870.000	70.0000	69/05/17	70/08/02
01090	ZINC	ZN,DISS	UG/L	10	86.0000	4871.11	69.7933	.811550	22.0706	200.000	.000000	69/05/17	70/08/02
31501	TOT COLI	MEMENDO	/100ML	6	6.16667	136.967	11.7033	1.89763	4.77784	30.0000	1.00000	70/05/13	70/05/28
31616	FEC COLI	MEM-FCBR	/100ML	7	1.42857	1.23572	1.13339	.793726	.428572	4.00000	1.00000	70/05/13	70/08/11
31673	FECSTREP	MEKFAGAR	/100ML	1	4.00000					4.00000	4.00000	70/08/11	70/08/11

STORET DATE 72/11/23

293011
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SODA BUTTE CR. AT COOKE CITY
00 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
11170R 77777777
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INDEX 1021500
MILES 1149.40
PARAMETER

70507 PHOS-T ORTHO MG/L P	NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
	9	.018000	.000726	.026036	1.55754	.009345	.090000	.000000	69/05/17	70/08/02

STATET DATE 72/12/28

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ROCKY CRK. ABOVE COOKE CITY
00 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 00150
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	TEMP	WKSN	DEG C	1	8.20000					8.20000	8.20000	69/05/17	69/05/17
00095	CNDUCTVY	AT 25C	MICROMHO	6	96.0000	665.900	25.4262	.264934	12.0132	131.000	57.0000	69/05/17	69/10/16
00400	PH		SU	6	7.48333	.069727	.264056	.035286	.107801	7.60000	7.20000	69/05/17	69/10/16
00410	T ALK	CACO3	MG/L	6	45.0000	167.200	12.9306	.287346	5.27589	58.0000	26.0000	69/05/17	69/10/16
00515	RESIDUE	DISS-105	C MG/L	6	70.0000	652.800	25.5499	.364999	10.4307	111.000	42.0000	69/05/17	69/10/16
00620	NO3-N	TOTAL	MG/L	6	.015000	.000070	.008367	.557774	.003416	.030000	.010000	69/05/17	69/10/16
00665	PHOS-T	P-SET	MG/L	6	.276666	.261266	.511142	1.84750	.208673	1.32000	.060000	69/05/17	69/10/16
00722	CYANIDE	CN	MG/L	2	.015000	.000450	.021213	1.41421	.015000	.030000	.000000	69/09/19	69/10/16
00900	TOT HARD	CACO3	MG/L	6	35.1166	164.766	12.5929	.387077	5.54926	49.9000	15.0000	69/05/17	69/10/16
00915	CALCIUM	CA,DISS	MG/L	6	12.3000	7.76011	2.78570	.217633	1.13726	16.0000	7.80000	69/05/17	69/10/16
00925	MGNSIUM	MG,DISS	MG/L	6	6.74999	49.6351	7.04521	1.04374	2.87620	21.0000	2.50000	69/05/17	69/10/16
00930	SODIUM	NA,DISS	MG/L	6	5.05000	.547046	.739625	.146461	.301951	5.80000	4.00000	69/05/17	69/10/16
00935	POTSSIUM	K,DISS	MG/L	6	.516666	.293667	.541910	.878774	.221234	1.70000	.200000	69/05/17	69/10/16
00940	CHLORIDE	CL	MG/L	6	.133333	.038667	.196638	1.47479	.080277	.500000	.000000	69/05/17	69/10/16
00945	SULFATE	SO4	MG/L	6	7.46666	3.06670	1.75120	.234536	.714924	10.0000	5.00000	69/05/17	69/10/16
01000	ARSENIC	AS,DISS	UG/L	2	10.0000	.000000	.000000		.000000	10.0000	10.0000	69/05/17	69/06/17
01040	COPPER	CU-DISS	UG/L	6	28.3333	416.067	20.4124	.720439	8.33334	70.0000	20.0000	69/05/17	69/10/16
01045	IRON	TOTAL	UG/L	6	883.333	189668	435.508	.493028	177.796	1600.00	300.000	69/05/17	69/10/16
01049	LEAD	PB,DISS	UG/L	6	200.000	.000000	.000000		.000000	200.000	200.000	69/05/17	69/10/16
01055	MANGNESE	MN	UG/L	6	71.6667	16416.7	128.128	1.78783	52.3078	330.000	10.0000	69/05/17	69/10/16
01090	ZINC	ZN,DISS	UG/L	6	96.6667	106.673	10.3262	.106844	4.21649	110.000	80.0000	69/05/17	69/10/16
70507	PHOS-T	ORTHO	MG/L P	5	.052000	.000320	.017889	.344010	.008000	.070000	.030000	69/05/17	69/09/19

STOR-T DATE 72/11/23

223013
45 01 00.0 109 57 00.0 3
SODA BUTTE CR. BELOW COOKE CITY
00 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
111?MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00070	TURB	JKSN	JTU	1	15.0000					15.0000	15.0000	69/05/17	69/05/17
00095	CNDUCTVY	AT 25C	MICROMHO	6	151.000	1313.40	36.3098	.240462	14.8234	210.000	119.000	69/05/17	69/10/16
00400	PH		SU	6	7.43999	.120068	.346509	.046201	.141462	7.70000	6.80000	69/05/17	69/10/16
00410	T ALK	CACO3	MG/L	6	56.0000	175.600	13.2514	.236632	5.40987	73.0000	39.0000	69/05/17	69/10/16
00515	RESIDUE	DISS-105	C MG/L	6	85.3333	426.272	20.6463	.241949	8.42884	108.000	64.0000	69/05/17	69/10/16
00620	NO3-N	TOTAL	MG/L	6	.328333	.001257	.035449	1.25116	.014472	.100000	.010000	69/05/17	69/10/16
00665	PHOS-T	P-WET	MG/L	6	.183333	.051147	.226157	1.23358	.092328	.610000	.050000	69/05/17	69/10/16
00720	CYANIDE	CN	MG/L	2	.010000	.000200	.014142	1.41421	.010000	.020000	.000000	69/09/19	69/10/16
00900	TOT HARD	CACO3	MG/L	6	49.6166	526.384	22.9430	.462406	9.36646	77.2000	10.1000	69/05/17	69/10/16
00915	CALCIUM	CA,DISS	MG/L	6	17.0000	79.6000	8.92188	.524817	3.64234	25.0000	.000000	69/05/17	69/10/16
00925	MGNSIUM	MG,DISS	MG/L	6	9.06666	37.4627	6.12068	.675075	2.49876	21.0000	3.80000	69/05/17	69/10/16
00930	SODIUM	NA,DISS	MG/L	6	4.33333	1.56670	1.25168	.288849	.510996	6.30000	3.00000	69/05/17	69/10/16
00935	PTSSIUM	K,DISS	MG/L	5	.800000	.276000	.525357	.656697	.214476	1.80000	.300000	69/05/17	69/10/16
00940	CHLORIDE	CL	MG/L	5	.660000	1.20600	1.09909	1.66529	.491528	2.60000	.000000	69/05/17	69/10/16
00945	SULFATE	SO4	MG/L	6	16.5000	44.7000	6.68581	.405200	2.72947	25.0000	6.00000	69/05/17	69/10/16
01000	ARSENIC	AS,DISS	UG/L	2	10.0000	.000000	.000000		.000000	10.0000	10.0000	69/05/17	69/06/17
01040	COPPER	CU-DISS	UG/L	6	28.3333	256.667	16.0208	.565441	6.54048	60.0000	20.0000	69/05/17	69/10/16
01045	IRON	TOTAL	UG/L	6	4283.33	.345E+08	5879.94	1.37275	2400.47	16000.0	700.000	69/05/17	69/10/16
01049	LEAD	PB,DISS	UG/L	6	200.000	.000000	.000000		.000000	200.000	200.000	69/05/17	69/10/16
01055	MANGNESE	MN	UG/L	6	110.000	10480.0	102.372	.930653	41.7931	300.000	30.0000	69/05/17	69/10/16
01090	ZINC	ZN,DISS	UG/L	6	100.000	.000000	.000000		.000000	100.000	100.000	69/05/17	69/10/16
70507	PHOS-T	ORTHO	MG/L P	5	.040000	.000650	.025495	.637378	.011402	.080000	.020000	69/05/17	69/09/19

START DATE 70/01/23

273014
45 04 54.0 110 45 14.0 3
YELLOWSTONE R. BELOW GARDINER
00 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	14	12.3929	22.4634	4.74009	.382485	1.26664	20.0000	5.50000	70/05/07	70/08/01
00020	AIR	TEMP	CENT	14	16.3571	53.9784	7.34700	.449162	1.96357	32.0000	7.00000	70/05/07	70/08/01
00060	STREAM	FLOW	CFS	14	4414.23	5877129	2424.28	.549189	647.916	9700.00	1470.00	70/05/07	70/08/01
00070	TURB	JKSN	JTU	6	5.81666	32.4777	5.69852	.979758	2.32657	17.0000	.900000	70/05/07	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	4	138.000	1304.00	36.1109	.261673	18.0555	188.000	104.000	70/05/07	70/08/01
00300	DO		MG/L	4	8.94999	.516764	.718863	.080320	.359432	10.0000	9.40000	70/05/07	70/08/01
00301	BOD	2 DAY	MG/L	4	1.07500	.342502	.585236	.544400	.292615	1.80000	.400000	70/05/14	70/07/28
00310	BOD	5 DAY	MG/L	4	1.37500	.242502	.492444	.358142	.246222	2.10000	1.00000	70/05/14	70/07/28
00400	PH		SU	4	7.40000	.206596	.454638	.061438	.227319	7.90000	6.80000	70/05/07	70/08/01
00403	LAB	PH	SU	8	7.65000	.057129	.239017	.031244	.084505	8.10000	7.30000	70/05/07	70/08/01
00410	T ALK	CACO3	MG/L	6	44.5000	66.2000	8.14248	.182977	3.32415	61.0000	40.0000	70/05/07	70/08/01
00500	RESIDUE	TOTAL	MG/L	4	137.250	1192.92	34.5386	.251647	17.2693	168.000	94.0000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	4	107.750	1422.25	37.7127	.350002	18.8563	159.000	69.0000	70/05/07	70/08/01
00610	NH3-N	TOTAL	MG/L	4	.035000	.001100	.033166	.947607	.016533	.080000	.010000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.180000	.008333	.091267	.507151	.045644	.310000	.100000	70/05/07	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.030000	.003667	.060553	.756914	.030277	.170000	.040000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.062500	.001558	.039476	.631612	.019738	.120000	.030000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	5.75000	12.6967	3.56324	.619695	1.78162	11.0000	3.30000	70/05/07	70/08/01
00720	CYANIDE	CN	MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/05/24
00915	CALCIUM	CA,DISS	MG/L	4	10.4000	3.23011	1.81111	.174145	.905554	13.0000	8.80000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	4.02500	.529180	.727447	.180732	.363724	5.10000	3.50000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	10.9000	20.7401	4.55413	.417810	2.27706	17.0000	6.10000	70/05/07	70/08/01
00935	POTSSIUM	K,DISS	MG/L	4	2.72500	.735830	.857805	.314791	.428903	3.80000	1.70000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	4	6.25000	11.5833	3.40343	.544549	1.70171	11.0000	3.00000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	20.0000	146.667	12.1106	.605530	6.05530	38.0000	12.0000	70/05/07	70/08/01
00950	FLUORIDE	F,DISS	MG/L	4	.500000	.086667	.294392	.588784	.147196	.900000	.200000	70/05/07	70/08/01
00955	SILICA	DISOLVED	MG/L	2	15.5000	.500000	.707107	.045620	.500000	16.0000	15.0000	70/07/22	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	885.000	316633	562.702	.635921	281.351	1400.00	220.000	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	40.0000	1133.33	33.6650	.841625	16.8325	80.0000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
31501	TOT COLI	MFIMENDO	/100ML	5	107.800	4104.21	64.0641	.594287	28.6503	200.000	55.0000	70/05/13	70/05/17
31616	FEC COLI	MFM-FCBR	/100ML	10	53.9000	754.769	27.4730	.509704	8.68774	120.000	24.0000	70/05/13	70/07/29
31673	FECSTREP	MFKFASAR	/100ML	5	61.8000	716.205	26.7620	.433042	11.9683	100.000	30.0000	70/07/25	70/07/29
32730	PHENOLS		UG/L	2	1.45000	1.12500	1.06066	.731490	.750000	2.20000	.700000	70/05/07	70/05/24
70507	PHOS-T	ORTHO	MG/L P	4	.025000	.000204	.014283	.571315	.007141	.046000	.014000	70/05/07	70/08/01

STORET DATE 72/11/23

293015
45 02 00.0 110 42 30.0 3
YELLOWSTONE RIVER AT GARDINER
30 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1023500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	4	12.0000	47.8333	6.91616	.576347	3.45808	20.0000	5.50000	70/05/07	70/08/01
00020	AIR	TEMP	CENT	4	18.5000	107.000	10.3441	.559139	5.17204	32.0000	9.00000	70/05/07	70/08/01
00070	TURB	JKSN	JTU	4	8.05000	45.4767	6.74364	.837720	3.37182	16.0000	1.00000	70/05/07	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	4	117.250	907.583	30.1261	.256939	15.0631	161.000	92.0000	70/05/07	70/08/01
00300	OD		MG/L	4	9.09999	.893392	.945194	.103868	.472597	10.4000	8.40000	70/05/07	70/08/01
00400	PH		SU	4	7.42500	.249237	.499236	.067237	.249618	8.10000	6.90000	70/05/07	70/08/01
00403	LAB	PH	SU	4	7.45000	.043396	.208293	.027959	.104146	7.70000	7.20000	70/05/07	70/08/01
00410	T ALK	CACO3	MG/L	4	41.0000	75.3333	8.67948	.211695	4.33974	54.0000	36.0000	70/05/07	70/08/01
00500	RESIDUE	TOTAL	MG/L	3	128.667	1794.35	42.3598	.329221	24.4564	162.000	81.0000	70/05/07	70/07/22
00515	RESIDUE	DISS-105	C MG/L	3	100.333	1302.35	36.0881	.359682	20.8354	142.000	79.0000	70/05/07	70/07/22
00610	NH3-N	TOTAL	MG/L	4	.050000	.002533	.050332	1.00664	.025166	.120000	.000000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.167500	.008092	.089953	.537036	.044977	.300000	.100000	70/05/07	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.065000	.001500	.038730	.595845	.019365	.120000	.030000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.095000	.007367	.085829	.903467	.042915	.200000	.020000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	4.40000	10.7467	3.27821	.745049	1.63911	9.20000	2.20000	70/05/07	70/08/01
00915	CALCIUM	CA,DISS	MG/L	4	8.80000	5.59334	2.36502	.268753	1.18251	12.0000	6.50000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	3.37500	.049164	.221729	.065697	.110865	3.60000	3.10000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	10.2000	19.4934	4.41513	.432856	2.20757	16.0000	5.80000	70/05/07	70/08/01
00935	PTSSIUM	K,DISS	MG/L	4	2.32500	.982503	.991213	.426328	.495606	3.40000	1.00000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	4	5.00000	4.66667	2.16025	.432049	1.08012	8.00000	3.00000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	17.0000	116.667	10.8012	.635367	5.40062	33.0000	10.0000	70/05/07	70/08/01
00950	FLUORIDE	F,DISS	MG/L	4	.475000	.042500	.206155	.434011	.103078	.700000	.200000	70/05/07	70/08/01
00955	SILICA	DISOLVED	MG/L	2	15.0000	2.00000	1.41421	.094281	1.00000	16.0000	14.0000	70/07/22	70/08/01
01000	ARSENIC	AS,DISS	UG/L	3	63.3333	3433.34	58.5947	.925179	33.8296	130.000	20.0000	70/05/07	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01020	BORON	B,DISS	UG/L	3	176.667	933.375	30.5512	.172931	17.6387	210.000	150.000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	1050.00	752400	867.410	.826105	433.705	1800.00	240.000	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	32.5000	2225.00	47.1699	1.45138	23.5849	100.000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/24	70/08/01
01093	ZN MOD	DRY WGT	MG/KG-ZN	1	3.00000					3.00000	3.00000	70/05/07	70/05/07
01145	SELENIUM	SE,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/06/01
09503	RA-226	DISOLVED	PC/L	1	.030000					.030000	.030000	70/05/07	70/05/07
22703	U-NAT	DISOLVED	UG/L	1	.300000					.300000	.300000	70/05/07	70/05/07
38260	MBAS		MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/07/22
39365	DDE	WHL SMPL	UG/L	1	.010000					.010000	.010000	70/07/22	70/07/22
39373	DDT	WHL SMPL	UG/L	1	.000000					.000000	.000000	70/07/22	70/07/22
70507	PHOS-T	ORTHO	MG/L P	4	.029500	.000340	.018448	.625362	.009224	.050000	.009000	70/05/07	70/08/01

STORET DATE 72/11/28

273017
+ 57 30.0 111 05 00.0 3
GALLATIN R. AT US-191 CROSSING
30 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1.17MBR
0000 77777777

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	14.5000	4.50000	2.12132	.146298	1.50000	16.0000	13.0000	70/07/17	70/07/30
00020	AIR	TEMP	CENT	2	23.5000	40.5000	6.36396	.270807	4.50000	28.0000	19.0000	70/07/17	70/07/30
00060	STREAM	FLOW	CFS	2	184.500	5724.50	75.6604	.410084	53.5000	238.000	131.000	70/07/17	70/07/30
00070	TURB	JKSN	JTU	2	.950000	.005001	.070718	.074440	.050005	1.00000	.900000	70/07/17	70/07/30
00095	CNDUCTVY	AT 25C	MICROMHO	2	269.500	220.500	14.8492	.055099	10.5000	280.000	259.000	70/07/17	70/07/30
00300	DO		MG/L	2	7.55000	2.20500	1.48493	.196679	1.05000	8.60000	6.50000	70/07/17	70/07/30
00400	PH		SU	2	8.24999	.045227	.212666	.025778	.150378	8.40000	8.10000	70/07/17	70/07/30
00403	LAB	PH	SU	2	8.10000	.000031	.005524	.000682	.003906	8.10000	8.10000	70/07/17	70/07/30
00410	T ALK	CACO3	MG/L	2	108.500	12.5000	3.53553	.032586	2.50000	111.000	106.000	70/07/17	70/07/30
00500	RESIDUE	TOTAL	MG/L	1	237.000					237.000	237.000	70/07/17	70/07/30
00515	RESIDUE	DISS-105	C MG/L	1	190.000					190.000	190.000	70/07/17	70/07/17
00610	NH3-N	TOTAL	MG/L	2	.010000	.000200	.014142	1.41421	.010000	.020000	.000000	70/07/17	70/07/30
00625	TOT KJEL	N	MG/L	2	.135000	.036450	.190919	1.41421	.135000	.270000	.000000	70/07/17	70/07/30
00630	NO2&NO3	N-TOTAL	MG/L	2	.010000	-.145E-10	.000000		.000000	.010000	.010000	70/07/17	70/07/30
00665	PHOS-T	P-WET	MG/L	2	.080000	.005000	.070711	.883883	.050000	.130000	.030000	70/07/17	70/07/30
00680	T ORG C	C	MG/L	2	7.05000	.045013	.212164	.030094	.150022	7.20000	6.90000	70/07/17	70/07/30
00915	CALCIUM	CA,DISS	MG/L	2	28.5000	180.500	13.4350	.471404	9.50000	38.0000	19.0000	70/07/17	70/07/30
00925	MGNSIUM	MG,DISS	MG/L	2	9.20000	13.5201	3.67697	.399670	2.60001	11.8000	6.60000	70/07/17	70/07/30
00930	SODIUM	NA,DISS	MG/L	2	1.75000	.005002	.070725	.040414	.050010	1.80000	1.70000	70/07/17	70/07/30
00935	PTSSIUM	K,DISS	MG/L	2	1.000000	.179999	.424263	.424263	.300000	1.30000	.700000	70/07/17	70/07/30
00940	CHLORIDE	CL	MG/L	2	.250000	.125000	.353553	1.41421	.250000	.500000	.000000	70/07/17	70/07/30
00945	SULFATE	SO4	MG/L	2	31.5000	24.5000	4.94975	.157135	3.50000	35.0000	28.0000	70/07/17	70/07/30
00950	FLUORIDE	F,DISS	MG/L	2	.150000	.005000	.070711	.471404	.050000	.200000	.100000	70/07/17	70/07/30
00955	SILICA	DISOLVED	MG/L	2	15.5000	4.50000	2.12132	.136859	1.50000	17.0000	14.0000	70/07/17	70/07/30
01005	BARIUM	BA,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
01040	COPPER	CU-DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
01045	IRON	TOTAL	UG/L	2	90.0000	16200.0	127.279	1.41421	90.0000	180.000	.000000	70/07/17	70/07/30
01049	LEAD	PB,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
01055	MANGNESE	MN	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/17	70/07/30
01090	ZINC	ZN,DISS	UG/L	2	15.0000	450.000	21.2132	1.41421	15.0000	30.0000	.000000	70/07/17	70/07/30
70507	PHOS-T	ORTHO	MG/L P	2	.020000	-.232E-09	.000000		.000000	.020000	.020000	70/07/17	70/07/30

STORET DATE 72/11/29

293013
45 02 55.5 111 08 46.0 3
GALLATIN R. AT WEST PARK BOUND.
00 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021600
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	13	5.07692	11.4103	3.37791	.665346	.936864	14.0000	1.00000	70/05/08	70/08/19
00020	AIR	TEMP	CENT	13	9.30769	47.6058	6.89969	.741289	1.91363	28.0000	3.00000	70/05/08	70/08/19
00060	STREAM	FLOW	CFS	1	180.000					180.000	180.000	70/08/18	70/08/18
00070	TURB	JKSN	JTU	4	2.80000	17.1000	4.13521	1.47686	2.06761	9.00000	.600000	70/05/08	70/07/30
00095	CNDUCTVY	AT 25C	MICROMHO	4	209.750	16748.9	129.418	.617009	64.7088	376.000	63.0000	70/05/08	70/07/30
00300	DO		MG/L	4	9.30000	.206787	.454738	.048897	.227369	9.70000	6.70000	70/05/08	70/07/30
00310	BOD	2 DAY	MG/L	2	.949999	.045000	.212132	.223297	.150000	1.10000	.800000	70/05/20	70/05/21
00310	BOD	5 DAY	MG/L	2	1.30000	.020001	.141426	.108789	.100003	1.40000	1.20000	70/05/20	70/05/21
00400	PH		SU	4	7.87500	.135895	.368639	.046811	.184320	8.30000	7.40000	70/05/08	70/07/30
00403	LAB	PH	SU	7	7.94235	.356242	.596860	.075144	.225592	9.10000	7.20000	70/05/08	70/08/17
00410	T ALK	CACO3	MG/L	5	87.6000	1604.81	40.0600	.457306	17.9154	139.000	29.0000	70/05/08	70/08/17
00500	RESIDUE	TOTAL	MG/L	3	249.333	2789.37	52.8145	.211823	30.4925	296.000	192.000	70/05/08	70/07/17
00515	RESIDUE	DISS-105	C MG/L	3	179.667	6249.37	79.0530	.439998	45.6412	257.000	99.0000	70/05/08	70/07/17
00610	NH3-N	TOTAL	MG/L	4	.020000	.000467	.021602	1.08012	.010801	.050000	.000000	70/05/08	70/07/30
00625	TOT KJEL	N	MG/L	4	.240000	.102000	.319374	1.33073	.159687	.710000	.030000	70/05/08	70/07/30
00630	NO2&NO3	N-TOTAL	MG/L	4	.060000	.003933	.062716	1.04527	.031358	.140000	.010000	70/05/08	70/07/30
00665	PHOS-T	P-WET	MG/L	4	.060000	.005400	.073485	1.22474	.036742	.170000	.020000	70/05/08	70/07/30
00680	T ORG C	C	MG/L	3	8.10000	.120148	.346623	.042793	.200123	8.30000	7.70000	70/05/08	70/07/30
00720	CYANIDE	CN	MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/05/23
00915	CALCIUM	CA,DISS	MG/L	4	29.6500	1154.62	33.9797	1.14603	16.9899	80.0000	5.60000	70/05/08	70/07/30
00925	MGNSIUM	MG,DISS	MG/L	4	9.05000	46.1767	6.79534	.750866	3.39767	18.0000	1.70000	70/05/08	70/07/30
00930	SODIUM	NA,DISS	MG/L	4	7.52500	107.236	10.3555	1.37614	5.17774	23.0000	1.50000	70/05/08	70/07/30
00935	POTSSIUM	K,DISS	MG/L	4	1.40000	.286667	.535413	.382438	.267707	2.00000	.700000	70/05/08	70/07/30
00940	CHLORIDE	CL	MG/L	4	2.20000	14.9800	3.87040	1.75927	1.93520	8.00000	.100000	70/05/08	70/07/30
00945	SULFATE	SO4	MG/L	4	33.5750	1187.52	34.4604	1.02637	17.2302	84.0000	6.30000	70/05/08	70/07/30
00950	FLUORIDE	F,DISS	MG/L	4	.150000	.030000	.173205	1.15470	.086603	.400000	.000000	70/05/08	70/07/30
00955	SILICA	DISOLVED	MG/L	2	27.0000	200.000	14.1421	.523783	10.0000	37.0000	17.0000	70/07/17	70/07/30
01000	ARSENIC	AS,DISS	UG/L	4	2.50000	25.0000	5.00000	2.00000	2.50000	10.0000	.000000	70/05/08	70/07/30
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01020	BORON	B,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/06	70/07/30
01045	IRON	TOTAL	UG/L	4	310.000	281733	530.786	1.71221	265.393	1100.00	.000000	70/05/08	70/07/30
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01055	MANGNESE	MN	UG/L	4	32.5000	2091.67	45.7347	1.40722	22.8674	100.000	.000000	70/05/08	70/07/30
01090	ZINC	ZN,DISS	UG/L	4	5.00000	100.000	10.0000	2.00000	5.00000	20.0000	.000000	70/05/08	70/07/30
01145	SELENIUM	SE,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
09503	RA-226	DISOLVED	PC/L	1	.050000					.050000	.050000	70/05/08	70/05/08
22703	U-NAT	DISOLVED	UG/L	1	.100000					.100000	.100000	70/05/08	70/05/08
31501	TOT COLI	MEIMENDO	/100ML	5	123.200	15796.7	125.685	1.02017	56.2080	260.000	13.0000	70/05/18	70/05/22

STORET DATE 72/12/28

293016
45 02 55.5 111 08 46.0 3
GALLATIN R. AT WEST PARK BOUND.
30 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
111MBR 77777777
0000

INDEX 1021300
MILES 1147.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
31616	FEC COLI	MFM-FCBR	/100ML	9	33.3333	1811.75	42.5647	1.11038	14.1682	140.000	9.00000	70/05/16	70/08/19
31673	FECSTREP	MFKFAGAR	/100ML	4	68.7500	10193.2	100.986	1.46889	50.4932	220.000	13.0000	70/08/16	70/08/19
32730	PHENOLS		UG/L	2	1.40000	.500000	.707107	.505076	.500000	1.90000	.900000	70/05/08	70/05/23
38260	MBAS		MG/L	3	.010000	.000100	.010000	1.00000	.005773	.020000	.000000	70/05/08	70/07/30
70507	PHOS-T	ORTHO	MG/L P	4	.031750	.001058	.032520	1.02427	.016260	.080000	.009000	70/05/08	70/07/30

STORET DATE 72/11/28

293019
44 39 20.0 111 04 00.0 3
MADISON RIVER NEAR WEST ENTRANCE
60 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1142.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	16	14.4062	14.7073	3.83501	.266204	.958752	21.0000	9.00000	70/05/08	70/08/19
00020	AIR	TEMP	CENT	16	12.1250	34.7633	5.89774	.486411	1.47443	24.0000	4.00000	70/05/08	70/08/19
00060	STREAM	FLOW	CFS	16	670.125	59990.1	244.908	.365467	61.2271	1300.00	455.000	70/05/08	70/08/19
00070	TURB	JKSN	JTU	4	1.65000	2.21666	1.48884	.902330	.744422	3.80000	.600000	70/05/08	70/07/30
00095	CNDUCTVY	AT 25C	MICROMHO	4	341.500	5315.00	72.9040	.213482	36.4520	400.000	236.000	70/05/08	70/07/30
00300	DO		MG/L	4	7.34999	.616760	.785341	.106849	.392670	7.90000	6.20000	70/05/08	70/07/30
00304	BOD	2 DAY	MG/L	3	.733333	.093334	.305506	.416600	.176384	1.00000	.400000	70/05/20	70/08/12
00310	BOD	5 DAY	MG/L	3	1.36667	.363336	.602773	.441054	.348011	2.00000	.800000	70/05/20	70/08/12
00400	PH		SU	4	7.39999	.260106	.510006	.068920	.255003	8.10000	6.90000	70/05/08	70/07/30
00403	LAB	PH	SU	9	7.86666	.170044	.412364	.052419	.137455	8.70000	7.40000	70/05/08	70/08/17
00410	T ALK	CACO3	MG/L	5	92.4000	416.807	20.4158	.220951	9.13024	109.000	57.0000	70/05/08	70/08/17
00500	RESIDUE	TOTAL	MG/L	3	269.333	3596.41	59.9700	.222661	34.6237	317.000	202.000	70/05/08	70/07/21
00515	RESIDUE	DISS-105	C MG/L	3	223.333	3920.37	62.0129	.280356	36.1496	273.000	153.000	70/05/08	70/07/21
00610	NH3-N	TOTAL	MG/L	4	.015000	.000167	.012910	.860663	.006455	.030000	.000000	70/05/08	70/07/30
00625	TOT KJEL	N	MG/L	4	.280000	.047267	.217409	.776463	.108705	.500000	.060000	70/05/08	70/07/30
00630	NO2&NO3	N-TOTAL	MG/L	4	.005000	.000100	.010000	2.00000	.005000	.020000	.000000	70/05/08	70/07/30
00665	PHOS-T	P-WET	MG/L	4	.117500	.005025	.070887	.603297	.035444	.190000	.020000	70/05/08	70/07/30
00680	T ORG C	C	MG/L	4	6.84999	.243413	.493369	.072025	.246685	7.40000	6.20000	70/05/08	70/07/30
00720	CYANIDE	CN	MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/05/23
00915	CALCIUM	CA,DISS	MG/L	4	5.77499	2.16924	1.47284	.255037	.736418	7.80000	4.30000	70/05/08	70/07/30
00925	MGNSIUM	MG,DISS	MG/L	4	.725000	.022500	.150001	.206898	.075001	.900000	.600000	70/05/08	70/07/30
00930	SODIUM	NA,DISS	MG/L	4	61.7500	164.917	12.8420	.207967	6.42099	71.0000	43.0000	70/05/08	70/07/30
00935	POTSSIUM	K,DISS	MG/L	4	7.72499	2.72926	1.65205	.213857	.826024	9.00000	5.40000	70/05/08	70/07/30
00940	CHLORIDE	CL	MG/L	4	41.7500	84.2500	9.17878	.219851	4.58939	47.0000	28.0000	70/05/08	70/07/30
00945	SULFATE	SO4	MG/L	4	16.0000	40.6667	6.37704	.398565	3.18852	25.0000	11.0000	70/05/08	70/07/30
00950	FLUORIDE	F,DISS	MG/L	4	5.37500	2.02921	1.42450	.265024	.712251	6.40000	3.30000	70/05/08	70/07/30
00955	SILICA	DISOLVED	MG/L	2	92.0000	50.0000	7.07107	.076859	5.00000	97.0000	87.0000	70/07/21	70/07/30
01000	ARSENIC	AS,DISS	UG/L	4	227.500	1758.33	41.9325	.184319	20.9662	270.000	170.000	70/05/08	70/07/30
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01020	BORON	B,DISS	UG/L	4	512.500	6691.66	81.8026	.159615	40.9013	610.000	410.000	70/05/08	70/07/30
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01045	IRON	TOTAL	UG/L	4	237.500	32291.7	179.699	.756627	89.8494	400.000	.000000	70/05/08	70/07/30
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01055	MANGNESE	MN	UG/L	4	50.0000	2733.33	52.2813	1.04563	26.1406	100.000	.000000	70/05/08	70/07/30
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01145	SELENIUM	SE,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
09503	RA-226	DISOLVED	PC/L	1	.010000					.010000	.010000	70/05/08	70/05/08
22703	U-NAT	DISOLVED	UG/L	1	.300000					.300000	.300000	70/05/08	70/05/08
31501	TOT COLI	MEMBRNE	/100ML	6	175.500	22231.5	149.270	.850541	60.9392	390.000	53.0000	70/05/18	70/05/27

STORET DATE 77/11/23

293019
44 39 20.0 111 04 00.0 3
MADISON RIVER NEAR WEST ENTRANCE
60 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
31616	FEC COLI	MFM-FCHR	/100ML	12	63.3333	6984.06	83.5707	1.31954	24.1248	280.000	5.00000	70/05/18	70/08/19
31673	FECSTREP	MFKFAGAR	/100ML	6	48.0000	92.8000	9.63327	.200693	3.93277	66.0000	40.0000	70/08/12	70/08/19
32730	PHENOLS		UG/L	2	3.10000	6.46000	2.54558	.821156	1.80000	4.90000	1.30000	70/05/08	70/05/23
38260	ABAS		MG/L	3	.020000	.000400	.020000	1.000000	.011547	.040000	.000000	70/05/08	70/07/30
39365	DDE	WHL SMPL	UG/L	1	.060000					.060000	.060000	70/07/23	70/07/23
39370	DDT	WHL SMPL	UG/L	1	.010000					.010000	.010000	70/07/23	70/07/23
70507	PHOS-T	ORTHO	MG/L P	4	.106000	.004421	.066488	.627247	.033244	.160000	.009000	70/05/08	70/07/30
71900	MERCURY	HG,TOTAL	UG/L	4	1.72500	.209167	.457348	.265129	.228674	2.40000	1.40000	70/05/08	70/07/30

STORET DATE 72/11/28

293020
45 04 10.0 110 37 45.0 2
BEAR CR MINE SPOIL SPILLS
30 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	14.0000	32.0000	5.65685	.404061	4.00000	18.0000	10.0000	70/07/22	70/08/01
00020	AIR	TEMP	CENT	2	24.7500	105.125	10.2530	.414265	7.25000	32.0000	17.5000	70/07/22	70/08/01
00070	TURB	JKSN	JTU	2	13.2500	325.125	18.0312	1.36085	12.7500	26.0000	.500000	70/07/22	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	2	74.0000	98.0000	9.89949	.133777	7.00000	81.0000	67.0000	70/07/22	70/08/01
00300	DO		MG/L	2	8.39999	.080185	.283169	.033711	.200231	8.60000	8.20000	70/07/22	70/08/01
00400	PH		SU	2	7.20000	.319992	.565678	.078566	.399995	7.60000	6.80000	70/07/22	70/08/01
00403	LAB	PH	SU	2	7.05000	.005020	.070853	.010050	.050101	7.10000	7.00000	70/07/22	70/08/01
00410	T ALK	CACO3	MG/L	2	35.0000	18.0000	4.24264	.121218	3.00000	38.0000	32.0000	70/07/22	70/08/01
00500	RESIDUE	TOTAL	MG/L	2	216.500	1200.50	34.6482	.160036	24.5000	241.000	192.000	70/07/22	70/08/01
00515	RESIDUE	DISS-105	C MG/L	2	89.0000	3362.00	57.9828	.651492	41.0000	130.000	48.0000	70/07/22	70/08/01
00610	NH3-N	TOTAL	MG/L	2	.005000	.000050	.007071	1.41421	.005000	.010000	.000000	70/07/22	70/08/01
00625	TOT KJEL	N	MG/L	2	.100000	.005000	.070711	.707107	.050000	.150000	.050000	70/07/22	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	2	.045000	.002450	.049497	1.09994	.035000	.080000	.010000	70/07/22	70/08/01
00665	PHOS-T	P-WET	MG/L	2	.060000	.001800	.042426	.707106	.030000	.090000	.030000	70/07/22	70/08/01
00680	T ORG C	C	MG/L	2	2.30000	1.28000	1.13137	.491901	.800001	3.10000	1.50000	70/07/22	70/08/01
00915	CALCIUM	CA,DISS	MG/L	2	7.25000	.604996	.777815	.107285	.549998	7.80000	6.70000	70/07/22	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	2	2.50000	.180003	.424268	.169707	.300003	2.80000	2.20000	70/07/22	70/08/01
00930	SODIUM	NA,DISS	MG/L	2	3.65000	.244995	.494970	.135608	.349997	4.00000	3.30000	70/07/22	70/08/01
00935	PTSSIUM	K,DISS	MG/L	2	1.35000	.045002	.212137	.157138	.150003	1.50000	1.20000	70/07/22	70/08/01
00940	CHLORIDE	CL	MG/L	2	.200000	.000000	.000000		.000000	.200000	.200000	70/07/22	70/08/01
00945	SULFATE	SO4	MG/L	2	10.7000	56.1800	7.49534	.700499	5.30000	16.0000	5.40000	70/07/22	70/08/01
00950	FLUORIDE	F,DISS	MG/L	2	.050000	.005000	.070711	1.41421	.050000	.100000	.000000	70/07/22	70/08/01
00955	SILICA	DISOLVED	MG/L	2	13.0000	2.00000	1.41421	.108786	1.00000	14.0000	12.0000	70/07/22	70/08/01
01000	ARSENIC	AS,DISS	UG/L	2	5.00000	50.0000	7.07107	1.41421	5.00000	10.0000	.000000	70/07/22	70/08/01
01005	BERIUM	BA,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
01020	BORON	B,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
01040	COPPER	CU-DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
01045	IRON	TOTAL	UG/L	2	750.000	1125000	1060.66	1.41421	750.000	1500.00	.000000	70/07/22	70/08/01
01049	LEAD	PB,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
01055	MANGNESE	MN	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
01090	ZINC	ZN,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
70507	PHOS-T	ORTHO	MG/L P	2	.010000	.000200	.014142	1.41421	.010000	.020000	.000000	70/07/22	70/08/01

START DATE 72/11/22

293021
49 03 45.0 110 38 05.0 2
BEAR CR BELOW MINE SPOIL PILES
30 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	14.0000	32.0000	5.65685	.404061	4.00000	18.0000	10.0000	70/07/22	70/08/01
00020	AIR	TEMP	CENT	2	24.5000	112.500	10.6066	.432922	7.50000	32.0000	17.0000	70/07/22	70/08/01
00060	STREAM	FLOW	CFS	1	33.4000					33.4000	33.4000	70/08/01	70/08/01
00070	TURB	JKSN	JTU	2	47.3000	4436.82	66.6095	1.39059	47.1000	95.0000	.600000	70/07/22	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	2	61.5000	4.50000	2.12132	.034493	1.50000	63.0000	60.0000	70/07/22	70/08/01
00300	DO		MG/L	2	8.55000	.245148	.495124	.057909	.350106	8.90000	8.20000	70/07/22	70/08/01
00400	PH		SU	2	7.10000	.320007	.565692	.079675	.400005	7.50000	6.70000	70/07/22	70/08/01
00403	LAB	PH	SU	2	7.10000	.020020	.141490	.019928	.100049	7.20000	7.00000	70/07/22	70/08/01
00410	T ALK	CACO3	MG/L	2	29.0000	2.00000	1.41421	.048766	1.00000	30.0000	28.0000	70/07/22	70/08/01
00500	RESIDUE	TOTAL	MG/L	2	463.500	223781	473.054	1.02061	334.500	798.000	129.000	70/07/22	70/08/01
00515	RESIDUE	DISS-105	C MG/L	2	91.5000	2812.50	53.0330	.579596	37.5000	129.000	54.0000	70/07/22	70/08/01
00610	NH3-N	TOTAL	MG/L	2	.060000	.007200	.084853	1.41421	.060000	.120000	.000000	70/07/22	70/08/01
00625	TOT KJEL	N	MG/L	2	.195000	.054450	.233345	1.19664	.165000	.360000	.030000	70/07/22	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	2	.045000	.002450	.049497	1.09994	.035000	.080000	.010000	70/07/22	70/08/01
00665	PHOS-T	P-WET	MG/L	2	.130000	.001800	.042427	.326358	.030000	.160000	.100000	70/07/22	70/08/01
00680	T ORG C	C	MG/L	2	3.85000	.604980	.777805	.202027	.549991	4.40000	3.30000	70/07/22	70/08/01
00915	CALCIUM	CA,DISS	MG/L	2	7.50000	10.5800	3.25269	.433692	2.30000	9.80000	5.20000	70/07/22	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	2	1.95000	.005000	.070711	.036262	.050001	2.00000	1.90000	70/07/22	70/08/01
00930	SODIUM	NA,DISS	MG/L	2	3.20000	.179993	.424255	.132580	.299994	3.50000	2.90000	70/07/22	70/08/01
00935	PTSSIUM	K,DISS	MG/L	2	3.45000	10.1250	3.18198	.922313	2.25000	5.70000	1.20000	70/07/22	70/08/01
00940	CHLORIDE	CL	MG/L	2	.350000	.005000	.070710	.202029	.050000	.400000	.300000	70/07/22	70/08/01
00945	SULFATE	SO4	MG/L	2	20.7500	528.125	22.9810	1.10752	16.2500	37.0000	4.50000	70/07/22	70/08/01
00950	FLUORIDE	F,DISS	MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
00955	SILICA	DISOLVED	MG/L	2	18.5000	.500000	.707107	.038222	.500000	19.0000	18.0000	70/07/22	70/08/01
01000	ARSENIC	AS,DISS	UG/L	2	30.0000	.000000	.000000		.000000	30.0000	30.0000	70/07/22	70/08/01
01005	BARIUM	BA,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
01020	BORON	B,DISS	UG/L	1	10.0000					10.0000	10.0000	70/08/01	70/08/01
01040	COPPER	CU-DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
01045	IRON	TOTAL	UG/L	2	1930.00	6265800	2503.16	1.29697	1770.00	3700.00	160.000	70/07/22	70/08/01
01049	LEAD	PB,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
01055	MANGNESE	MN	UG/L	2	225.000	101250	318.198	1.41421	225.000	450.000	.000000	70/07/22	70/08/01
01090	ZINC	ZN,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/01
70507	PHOS-T	ORTHO	MG/L P	2	.045000	.000450	.021213	.471407	.015000	.060000	.030000	70/07/22	70/08/01

STORET DATE 72/12/24

293022
45 01 00.0 109 56 10.0 2
ACID MINE ABOVE COOKE CITY
30 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1022500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00400	PH		SU	1	7.70000					7.70000	7.70000	70/08/25	70/08/25
00410	T ALK	CACO3	MG/L	1	84.0000					84.0000	84.0000	70/08/25	70/08/25
00435	T ACIDITY	CACO3	MG/L	1	6.00000					6.00000	6.00000	70/08/25	70/08/25
00945	SULFATE	SO4	MG/L	1	650.000					650.000	650.000	70/08/25	70/08/25
01045	IRON	TOTAL	UG/L	1	84000.0					84000.0	84000.0	70/08/25	70/08/25
71900	MERCURY	HG,TOTAL	UG/L	1	.800000					.800000	.800000	70/08/25	70/08/25

STORET DATE 72/11/28

293022
45 01 00.0 108 56 10.0 2
ACID MINE ABOVE COOKE CITY
30 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1022500
MILES 1140.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00400	PH		SU	1	7.70000					7.70000	7.70000	70/08/25	70/08/25
00410	T ALK	CACO3	MG/L	1	84.0000					84.0000	84.0000	70/08/25	70/08/25
00435	T ACDITY	CACO3	MG/L	1	6.00000					6.00000	6.00000	70/08/25	70/08/25
00945	SULFATE	SO4	MG/L	1	650.000					650.000	650.000	70/08/25	70/08/25
01045	IRON	TOTAL	UG/L	1	84000.0					84000.0	84000.0	70/08/25	70/08/25
71900	MERCURY	HG,TOTAL	UG/L	1	.800000					.800000	.800000	70/08/25	70/08/25

STORET DATE 72/11/23

293023
45 00 50.0 109 57 30.0 2
ACID MINE DRAINAGE DISCHARGE
30 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00400	PH		SU	1	7.60000					7.60000	7.60000	70/08/25	70/08/25
00410	T ALK	CACO3	MG/L	1	63.0000					63.0000	63.0000	70/08/25	70/08/25
00435	T ACDITY	CACO3	MG/L	1	7.00000					7.00000	7.00000	70/06/25	70/08/25
00945	SULFATE	SO4	MG/L	1	730.000					730.000	730.000	70/08/25	70/08/25
01045	IRON	TOTAL	UG/L	1	80000.0					80000.0	80000.0	70/08/25	70/08/25
71900	MERCURY	HG,TOTAL	UG/L	1	.700000					.700000	.700000	70/08/25	70/08/25

START DATE 72/12/23

571000
45 00 10.0 110 01 00.0 3
SODA BUTTE CREEK AT PARK BOUN..
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	16	4.71875	9.83223	3.13565	.664508	.783912	12.0000	1.00000	70/05/09	70/08/11
00020	AIR	TEMP	CENT	16	12.2500	43.9000	6.62571	.540874	1.65643	25.0000	.000000	70/05/09	70/08/11
00060	STREAM	FLOW	CFS	5	91.6200	3524.98	59.3716	.646605	26.5518	158.000	7.40000	70/05/16	70/08/02
00070	TURB	JKSN	JTU	7	6.94285	84.2396	9.17821	1.32196	3.46904	26.0000	1.60000	69/05/17	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	10	148.200	1627.96	40.3480	.272254	12.7592	235.000	92.0000	69/05/17	70/08/02
00300	DO		MG/L	4	9.07500	.489258	.699470	.077077	.349735	10.0000	8.40000	70/05/09	70/08/02
00334	BOD	2 DAY	MG/L	4	.475000	.142500	.377492	.794720	.188746	1.00000	.200000	70/05/14	70/07/28
00310	BOD	5 DAY	MG/L	4	.600000	.000000	.000564	.000940	.000282	.600000	.000000	70/05/14	70/07/28
00400	PH		SU	10	7.63000	.044542	.211050	.027661	.066740	8.00000	7.40000	69/05/17	70/08/02
00403	LAB	PH	SU	9	7.72222	.024475	.156445	.020259	.052148	7.90000	7.40000	70/05/09	70/08/11
00410	T ALK	CACO3	MG/L	12	63.5000	230.455	15.1807	.239067	4.38230	88.0000	39.0000	69/05/17	70/08/02
00500	RESIDUE	TOTAL	MG/L	4	125.750	700.916	26.4748	.210535	13.2374	156.000	95.0000	70/05/09	70/08/02
00515	RESIDUE	DISS-105	C MG/L	10	85.3000	816.243	28.6049	.335345	9.04568	134.000	41.0000	69/05/17	70/08/02
00610	NH3-N	TOTAL	MG/L	4	.015000	.000167	.012910	.860663	.006455	.030000	.000000	70/05/09	70/08/02
00620	N03-N	TOTAL	MG/L	6	.026667	.001307	.036148	1.35554	.014757	.100000	.010000	69/05/17	69/10/16
00625	TOT KJEL	N	MG/L	4	.090000	.005400	.073485	.816496	.036742	.150000	.000000	70/05/09	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	4	.047500	.001892	.043493	.915648	.021747	.090000	.010000	70/05/09	70/08/02
00665	PHOS-T	P-WET	MG/L	10	.122000	.032107	.179184	1.46872	.056663	.610000	.020000	69/05/17	70/08/02
00680	T ORG C	C	MG/L	4	4.70000	5.44670	2.33382	.496557	1.16691	7.90000	2.40000	70/05/09	70/08/02
00720	CYANIDE	CN	MG/L	2	.010000	.000200	.014142	1.41421	.010000	.020000	.000000	69/09/19	69/10/16
00900	TOT HARD	CACO3	MG/L	6	58.7666	511.523	22.6169	.384859	9.23330	99.5000	33.2000	69/05/17	69/10/16
00915	CALCIUM	CA,DISS	MG/L	10	19.6000	20.4893	4.52651	.230944	1.43141	30.0000	16.0000	69/05/17	70/08/02
00925	MGNSIUM	MG,DISS	MG/L	10	6.69999	25.3156	5.03146	.750965	1.59109	16.0000	.000000	69/05/17	70/08/02
00930	SODIUM	NA,DISS	MG/L	10	4.11000	.458801	.677349	.164805	.214196	5.50000	3.20000	69/05/17	70/08/02
00935	PTSSIUM	K,DISS	MG/L	10	.740000	.216000	.464758	.628052	.146969	1.70000	.300000	69/05/17	70/08/02
00940	CHLORIDE	CL	MG/L	10	.400000	.371111	.609189	1.52297	.192642	2.00000	.000000	69/05/17	70/08/02
00945	SULFATE	SO4	MG/L	10	13.9000	22.7667	4.77145	.343270	1.50886	22.0000	7.00000	69/05/17	70/08/02
00950	FLUORIDE	F,DISS	MG/L	4	.250000	.190000	.435890	1.74356	.217945	.900000	.000000	70/05/09	70/08/02
00955	SILICA	DISOLVED	MG/L	2	10.5000	.500000	.707107	.067343	.500000	11.0000	10.0000	70/07/22	70/08/02
01000	ARSENIC	AS,DISS	UG/L	5	4.00000	30.0000	5.47723	1.36931	2.44949	10.0000	.000000	69/05/17	70/08/02
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01020	BORON	B,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/24	70/08/02
01040	COPPER	CU-DISS	UG/L	10	14.0000	182.222	13.4990	.964212	4.26675	40.0000	.000000	69/05/17	70/08/02
01045	IRON	TOTAL	UG/L	10	2610.00	.144E+06	3801.60	1.45655	1202.17	11000.0	400.000	69/05/17	70/08/02
01049	LEAD	PB,DISS	UG/L	10	.000000	.000000	.000000		.000000	.000000	.000000	69/05/17	70/08/02
01055	MANGNESE	MN	UG/L	10	58.0000	7306.66	85.4790	1.47378	27.0308	270.000	.000000	69/05/17	70/08/02
01090	ZINC	ZN,DISS	UG/L	10	58.0000	2526.89	50.2861	.867035	15.9025	100.000	.000000	69/05/17	70/08/02
01145	SELENIUM	SE,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/22	70/08/02
31501	TOT COLI	MFIMENDO	/100ML	6	8.50000	241.900	15.5531	1.82976	6.34954	40.0000	1.00000	70/05/13	70/05/28

STORET DATE 72/11/23

571000
45 00 10.0 110 01 00.0 3
SODA BUTTE CREEK AT PARK BOUN.
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
31616	FEC COLI	MFM-FCBR	/100ML	12	3.66667	7.87880	2.80692	.765523	.810288	9.00000	1.00000	70/05/13	70/08/11
31673	FECSTREP	MFKFAGAR	/100ML	6	18.0000	1022.80	31.9812	1.77674	13.0563	83.0000	2.00000	70/07/25	70/08/11
33260	4315		MG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/24	70/08/02
70507	PHOS-T	ORTHO	MG/L P	9	.049778	.002336	.048337	.971052	.016112	.170000	.004000	69/05/17	70/08/02

STORET DATE 72/11/23

571001
44 03 30.0 110 07 30.0 3
SODA BUTTE CREEK NEAR MOUTH
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	6	5.83333	8.56669	2.92689	.501753	1.19490	10.0000	3.00000	70/05/09	70/08/11
00020	AIR	TEMP	CENT	6	12.8333	24.5667	4.95648	.386220	2.02348	17.0000	6.00000	70/05/09	70/08/11
00060	STREAM	FLOW	CFS	2	167.000	12432.0	111.723	.668999	79.0000	246.000	88.0000	70/05/16	70/07/22
00070	TURB	JKSN	JTU	5	2.86000	5.30800	2.30391	.805563	1.03034	6.10000	.600000	69/05/17	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	10	180.300	1547.35	39.3364	.218172	12.4393	245.000	136.000	69/05/17	70/08/02
00300	DO		MG/L	4	9.47499	.382568	.618521	.065279	.309261	10.0000	8.80000	70/05/09	70/08/02
00400	PH		SU	10	7.68999	.121012	.347866	.045236	.110006	8.20000	7.10000	69/05/17	70/08/02
00403	LAB	PH	SU	5	7.77999	.117126	.342237	.043989	.153053	8.30000	7.40000	70/05/09	70/08/11
00410	T ALK	CACO3	MG/L	10	85.6000	301.826	17.3731	.202957	5.49387	110.000	64.0000	69/05/17	70/08/02
00500	RESIDUE	TOTAL	MG/L	4	165.500	1966.33	44.3433	.267936	22.1717	229.000	127.000	70/05/09	70/08/02
00515	RESIDUE	DISS-105	C MG/L	10	109.700	763.354	27.6289	.251858	8.73701	148.000	71.0000	69/05/17	70/08/02
00610	NH3-N	TOTAL	MG/L	4	.012500	.000158	.012583	1.00664	.006292	.030000	.000000	70/05/09	70/08/02
00620	NO3-N	TOTAL	MG/L	6	.011667	.000017	.004083	.349929	.001667	.020000	.010000	69/05/17	69/10/16
00625	TOT KJEL	N	MG/L	4	.025000	.000700	.026457	1.05830	.013229	.060000	.000000	70/05/09	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	4	.027500	.001292	.035940	1.30690	.017970	.080000	.000000	70/05/09	70/08/02
00665	PHOS-T	P-WET	MG/L	10	.100000	.021333	.146059	1.46059	.046188	.510000	.020000	69/05/17	70/08/02
00680	T ORG C	C	MG/L	4	5.05000	11.8167	3.43754	.680701	1.71877	10.0000	2.40000	70/05/09	70/08/02
00720	CYANIDE	CN	MG/L	2	.015000	.000450	.021213	1.41421	.015000	.030000	.000000	69/09/19	69/10/16
00900	TOT HARD	CACO3	MG/L	6	83.1166	610.515	24.7086	.297276	10.0872	117.000	61.3000	69/05/17	69/10/16
00915	CALCIUM	CA,DISS	MG/L	10	25.2000	66.1779	8.13498	.322817	2.57251	43.0000	19.0000	69/05/17	70/08/02
00925	MGNSIUM	MG,DISS	MG/L	10	8.10000	16.9322	4.12094	.508759	1.30316	16.0000	1.00000	69/05/17	70/08/02
00930	SODIUM	NA,DISS	MG/L	10	3.20999	.136590	.369561	.115134	.116872	3.80000	2.70000	69/05/17	70/08/02
00935	PTSSIUM	K,DISS	MG/L	10	1.26000	.118223	.343835	.272885	.108730	2.00000	.700000	69/05/17	70/08/02
00940	CHLORIDE	CL	MG/L	10	.290000	.121000	.347850	1.19948	.110000	1.00000	.000000	69/05/17	70/08/02
00945	SULFATE	SO4	MG/L	10	10.2300	11.8179	3.43772	.336043	1.08710	14.0000	3.00000	69/05/17	70/08/02
00950	FLUORIDE	F,DISS	MG/L	4	.025000	.002500	.050000	2.00000	.025000	.100000	.000000	70/05/09	70/08/02
00955	SILICA	DISSLVED	MG/L	2	16.5000	.500000	.707107	.042855	.500000	17.0000	16.0000	70/07/22	70/08/02
01000	ARSENIC	AS,DISS	UG/L	2	10.0000	.000000	.000000		.000000	10.0000	10.0000	69/05/17	69/06/17
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01040	COPPER	CU-DISS	UG/L	10	13.0000	134.444	11.5950	.891924	3.66667	30.0000	.000000	69/05/17	70/08/02
01045	IRON	TOTAL	UG/L	10	1174.00	5179752	2275.91	1.93859	719.705	7600.00	150.000	69/05/17	70/08/02
01049	LEAD	PB,DISS	UG/L	10	120.000	10666.7	103.280	.860663	32.6598	200.000	.000000	69/05/17	70/08/02
01055	MANGNESE	MN	UG/L	10	29.0000	3654.44	60.4520	2.08455	19.1166	200.000	.000000	69/05/17	70/08/02
01090	ZINC	ZN,DISS	UG/L	10	65.0000	2983.33	54.6199	.840306	17.2723	130.000	.000000	69/05/17	70/08/02
31501	TOT COLI	MFIMENDO	/100ML	1	66.0000					66.0000	66.0000	70/05/28	70/05/28
31616	FEC COLI	MFM-FCBR	/100ML	2	8.00000	32.0000	5.65685	.707107	4.00000	12.0000	4.00000	70/05/28	70/08/11
31673	FECSTREP	MFKFAGAR	/100ML	1	9.00000					9.00000	9.00000	70/08/11	70/08/11
70507	PHOS-T	ORTHO	MG/L P	9	.044000	.000918	.030294	.688510	.010098	.110000	.005000	69/05/17	70/08/02

START DATE 70/11/24

571. 3
44 54 55.0 .10 19 24.0 3
LAMAR RIVER NEAR MOUTH
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1027500
MILES 1142.0

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	14	7.76571	20.9390	4.56138	.588434	1.22442	13.0000	2.00000	70/05/09	70/08/02
00020	AIR	TEMP	CENT	14	14.7143	42.2196	6.49766	.441590	1.73658	23.0000	5.00000	70/05/09	70/08/02
00070	TURB	JKSN	JTU	7	5.24285	36.6429	6.05333	1.15459	2.28795	17.0000	.600000	69/05/17	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	7	113.286	932.250	30.5328	.258127	11.5403	166.000	85.0000	69/05/17	70/08/02
00300	DO		MG/L	4	9.67500	.542562	.736588	.076133	.368294	10.4000	8.90000	70/05/09	70/08/02
00310	BOD	5 DAY	MG/L	4	.675000	.195833	.442530	.655601	.221265	1.10000	.200000	70/05/14	70/07/28
00400	PH		SU	4	.900000	.046667	.216025	.240028	.108012	1.10000	.600000	70/05/14	70/07/28
00403	LAB	PH	SU	7	7.42357	.085815	.292943	.039435	.110722	7.90000	7.10000	69/05/17	70/08/02
00410	T ALK	CACO3	MG/L	8	7.68749	.098424	.313725	.040810	.110919	8.00000	7.10000	70/05/09	70/08/02
00500	RESIDUE	TOTAL	MG/L	9	58.8389	237.363	15.4066	.270819	5.13553	82.0000	37.0000	69/05/17	70/08/02
00515	RESIDUE	DISS-105	C MG/L	4	120.250	706.916	26.5879	.221105	13.2940	140.000	81.0000	70/05/09	70/08/02
00610	NH3-N	TOTAL	MG/L	5	89.6000	300.807	17.3438	.193569	7.75637	119.000	75.0000	69/05/17	70/08/02
00625	TOT KJEL	N	MG/L	4	.012500	.000158	.012583	1.00664	.006292	.030000	.000000	70/05/09	70/08/02
00630	NO2NO3	N-TOTAL	MG/L	4	.052500	.002825	.053151	1.01239	.026575	.130000	.010000	70/05/09	70/08/02
00665	PHOS-T	P-WET	MG/L	4	.022500	.000692	.026300	1.16887	.013150	.050000	.000000	70/05/09	70/08/02
00680	T ORG C	C	MG/L	4	.102500	.007092	.084212	.821581	.042106	.220000	.020000	70/05/09	70/08/02
00720	CYANIDE	CN	MG/L	4	4.05000	5.53666	2.35301	.580990	1.17650	7.40000	1.90000	70/05/09	70/08/02
00931	TOT HARD	CACO3	MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/05/24
00915	CALCIUM	CA,DISS	MG/L	3	35.9333	19.8237	4.45238	.123907	2.57059	40.9000	32.3000	69/05/17	69/07/16
00925	MGNSIUM	MG,DISS	MG/L	4	12.7500	11.5833	3.40343	.266936	1.70171	16.0000	8.00000	70/05/09	70/08/02
00930	SODIUM	NA,DISS	MG/L	4	5.40000	4.32003	2.07847	.384902	1.03923	8.00000	3.20000	70/05/09	70/08/02
00935	PTSSIUM	K,DISS	MG/L	4	7.10000	3.34003	1.82757	.257405	.913787	9.50000	5.40000	70/05/09	70/08/02
00940	CHLORIDE	CL	MG/L	4	1.27500	.029166	.170781	.133946	.085391	1.50000	1.10000	70/05/09	70/08/02
00945	SULFATE	SO4	MG/L	7	.814285	1.03143	1.01559	1.24722	.383858	3.00000	.000000	69/05/17	70/08/02
00950	FLUORIDE	F,DISS	MG/L	7	10.6714	32.4425	5.69583	.533746	2.15252	22.0000	5.00000	69/05/17	70/08/02
00955	SILICA	DISOLVED	MG/L	4	.100000	.006667	.081650	.816497	.040825	.200000	.000000	70/05/09	70/08/02
01005	BARIUM	BA,DISS	UG/L	2	20.5000	.500000	.707107	.034493	.500000	21.0000	20.0000	70/07/22	70/08/02
01040	COPPER	CU-DISS	UG/L	4	.250000	.250000	.500000	2.00000	.250000	1.00000	.000000	70/05/09	70/08/02
01045	IRON	TOTAL	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01049	LEAD	PB,DISS	UG/L	4	505.000	512300	715.751	.889132	357.876	1800.00	240.000	70/05/09	70/08/02
01055	MANGNESE	MN	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01059	ZINC	ZN,DISS	UG/L	4	7.50000	225.000	15.0000	2.00000	7.50000	30.0000	.000000	70/05/09	70/08/02
09503	RA-226	DISOLVED	PC/L	1	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
22703	U-NAT	DISOLVED	UG/L	1	.010000					.010000	.010000	70/05/09	70/05/09
31501	TOT COLI	MFIMENCO	/100ML	5	.300000					.300000	.300000	70/05/09	70/05/09
31616	FEC COLI	MFM-FCBR	/100ML	10	44.2000	1974.20	44.4320	1.00525	19.8706	110.000	9.00000	70/05/13	70/05/17
31673	FECSTREP	MFKFAGAR	/100ML	5	21.5000	454.278	21.3138	.991339	6.74001	68.0000	4.00000	70/05/13	70/07/29
32730	PHENOLS		UG/L	5	26.6000	66.3007	8.17317	.307262	3.65515	34.0000	15.0000	70/07/25	70/07/29
				2	1.05000	1.12500	1.06066	1.01015	.750000	1.80000	.300000	70/05/09	70/05/24

STORET DATE 72/12/28

571003
44 54 39.0 110 19 24.0 3
LAMAR RIVER NEAR MOUTH
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER			NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
70507 PHOS-T ORTHO	MG/L P		4	.036750	.000312	.017652	.480321	.008826	.050000	.011000	70/05/09	70/08/02

STORET DATE 72/1/24

571004
44 33 45.0 110 23 00.0 3
YELLOWSTONE R. AT FISHING BRIDGE
SO WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117458 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	21	10.5476	42.7226	6.53825	.619690	1.42633	18.0000	.000000	70/05/07	70/08/19
00020	AIR	TEMP	CENT	21	13.7381	57.3407	7.56576	.550714	1.65098	24.0000	1.00000	70/05/07	70/08/19
00070	TURB	JKSN	JTU	7	3.51428	41.4843	6.44037	1.83277	2.43442	18.0000	.300000	69/05/20	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	7	87.8571	142.143	11.9226	.135704	4.50631	100.000	65.0000	69/05/20	70/08/01
00300	DO		MG/L	4	8.59999	.826741	.909253	.105727	.454627	9.80000	7.80000	70/05/07	70/08/01
00304	BOD	2 DAY	MG/L	5	.640000	.128000	.357772	.559018	.160000	1.00000	.200000	70/05/14	70/08/10
00310	BOD	5 DAY	MG/L	5	.940000	.098000	.313050	.333032	.140000	1.40000	.600000	70/05/14	70/08/10
00400	PH		SU	7	7.28571	.041463	.203625	.027949	.076963	7.60000	7.00000	69/05/20	70/08/01
00403	LAB	PH	SU	11	7.35454	.090698	.301161	.040949	.090804	7.80000	6.90000	70/05/07	70/08/17
00410	T ALK	CACO3	MG/L	10	28.8000	18.6459	4.34119	.150736	1.37280	36.0000	22.0000	69/05/20	70/08/17
00500	RESIDUE	TOTAL	MG/L	4	129.750	5176.25	71.9600	.554605	35.9800	212.000	59.0000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	5	75.0000	423.500	20.5791	.274388	9.20326	108.000	57.0000	69/05/20	70/08/01
00610	NH3-N	TOTAL	MG/L	4	.007500	.000092	.009574	1.27657	.004787	.020000	.000000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.130000	.000867	.029440	.226459	.014720	.160000	.090000	70/05/07	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.010000	.000200	.014142	1.41421	.007071	.030000	.000000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.055000	.002033	.045092	.819864	.022546	.120000	.020000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	2.92500	2.54916	1.59661	.545850	.798305	4.90000	1.10000	70/05/07	70/08/01
00720	CYANIDE	CN	MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/05/24
00900	TOT HARD	CACO3	MG/L	3	21.0333	11.7236	3.42398	.162788	1.97683	24.2000	17.4000	69/05/20	69/07/16
00915	CALCIUM	CA,DISS	MG/L	4	4.20000	1.32002	1.34908	.321210	.674541	5.30000	2.30000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	2.20000	.180003	.424267	.192349	.212134	2.60000	1.60000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	8.15000	2.59009	1.60937	.197469	.804687	10.0000	6.10000	70/05/07	70/08/01
00935	PTSSIUM	K,DISS	MG/L	4	1.67500	.062502	.250003	.149256	.125002	2.00000	1.40000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	7	5.21428	.494799	.703420	.134902	.265868	6.00000	4.00000	69/05/20	70/08/01
00945	SULFATE	SO4	MG/L	7	8.81429	1.00810	1.00404	.113910	.379491	10.0000	7.00000	69/05/20	70/08/01
00950	FLORIDE	F,DISS	MG/L	4	.475000	.009167	.095745	.201568	.047872	.600000	.400000	70/05/07	70/08/01
00955	SILICA	DISOLVED	MG/L	2	9.00000	2.00000	1.41421	.157135	1.00000	10.0000	8.00000	70/07/19	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	117.500	7225.00	85.0000	.723404	42.5000	200.000	.000000	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	10.0000	400.000	20.0000	2.00000	10.0000	40.0000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
09503	RA-226	DISOLVED	PC/L	1	.010000					.010000	.010000	70/05/07	70/05/07
22703	U-NAT	DISOLVED	UG/L	1	.000000					.000000	.000000	70/05/07	70/05/07
31501	TOT COLI	MFIMENDO	/100ML	6	14.5000	1093.50	33.0681	2.28056	13.5000	82.0000	1.00000	70/05/13	70/05/26
31616	FEC COLI	MFM-FCBP	/100ML	17	7.52941	455.515	21.3428	2.83459	5.17639	88.0000	1.00000	70/05/13	70/08/19
31673	FECSTREP	MFKFSGAR	/100ML	11	9.81818	376.164	19.3949	1.97541	5.84750	66.0000	1.00000	70/07/30	70/08/19
32730	PHENOLS		UG/L	3	2.30000	2.89000	1.70000	.739131	.981496	4.00000	.600000	70/05/07	70/08/05

STORET DATE 72/11/23

571004
44 37 45.0 110 23 00.0 3
YELLOWSTONE R. AT FISHING BRIDGE
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
70507 PHOS-T	METHO	MG/L P		4	.015500	.000051	.007141	.460737	.003571	.020000	.005000	70/05/07	70/06/01

STARET DATE 12/11/74

571 005
45 00 30.0 110 41 25.0 3
GARDINER RIVER BELOW MAMMOTH
60 AREAINS
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1144.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	16	14.1250	15.9167	3.98957	.282447	.997392	22.0000	6.50000	70/05/07	70/08/11
00020	AIR	TEMP	CENT	16	16.4375	58.5292	7.65044	.465426	1.91261	32.0000	5.00000	70/05/07	70/08/11
00070	TURB	JKSN	JTU	6	11.8167	320.425	17.9004	1.51435	7.30792	45.0000	.400000	70/05/07	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	4	426.500	10725.7	103.565	.242825	51.7824	538.000	290.000	70/05/07	70/08/01
00300	DO		MG/L	4	8.57500	.529297	.727528	.084843	.363764	9.60000	7.90000	70/05/07	70/08/01
00310	BOD	5 DAY	MG/L	4	.849999	.230000	.479583	.564216	.239791	1.30000	.300000	70/05/14	70/07/28
00400	PH	5 DAY	MG/L	4	1.02500	.082499	.287227	.280222	.143614	1.20000	.600000	70/05/14	70/07/28
00403	LAB	PH	SU	4	7.27500	.042531	.206231	.028349	.103116	7.50000	7.10000	70/05/07	70/08/01
00410	T ALK	CACO3	MG/L	9	7.53333	.045013	.212164	.028163	.070721	7.90000	7.10000	70/05/07	70/08/11
00500	RESIDUE	TOTAL	MG/L	6	121.000	298.300	17.2856	.142858	7.05691	146.000	92.0000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	4	386.500	10675.0	103.320	.265946	51.6599	469.000	287.000	70/05/07	70/08/01
00530	NH3-N	TOTAL	MG/L	4	311.250	8012.25	89.5112	.287586	44.7556	413.000	207.000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.007500	.000225	.015000	2.00000	.007500	.030000	.000000	70/05/07	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.310000	.054867	.234236	.755601	.117116	.630000	.130000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.052500	.001625	.040311	.767835	.020156	.110000	.020000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	.047500	.000358	.018930	.398521	.009465	.060000	.020000	70/05/07	70/08/01
00915	CALCIUM	CA,DISS	MG/L	4	11.4250	53.5892	7.32046	.640741	3.66023	16.0000	1.70000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	40.2500	134.917	11.6154	.288580	5.80763	50.0000	27.0000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	12.6250	16.5625	4.06970	.322353	2.03485	18.0000	9.00000	70/05/07	70/08/01
00935	PTSSIUM	K,DISS	MG/L	4	18.5000	55.0000	7.41620	.400876	3.70810	28.0000	10.0000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	4	7.64999	6.83011	2.61345	.341627	1.30672	10.4000	4.10000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	11.7500	28.9167	5.37742	.457653	2.68871	17.0000	5.00000	70/05/07	70/08/01
00950	FLUORIDE	F,DISS	MG/L	4	78.5000	851.666	29.1833	.371762	14.5917	120.000	52.0000	70/05/07	70/08/01
00955	SILICA	DISOLVED	MG/L	4	1.02500	.202500	.450000	.439025	.225000	1.60000	.500000	70/05/07	70/08/01
01005	BARIUM	BA,DISS	UG/L	2	24.0000	2.00000	1.41421	.058926	1.00000	25.0000	23.0000	70/07/22	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/09/01
01049	LEAD	PB,DISS	UG/L	4	1225.04	1235712	1111.03	.907422	555.813	2700.00	.150000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	30.0000	466.066	21.6025	.720082	10.8012	50.0000	.000000	70/05/07	70/08/01
31501	TOT COLI	MFIMENDO	/100ML	4	5.00000	33.3333	5.77350	1.15470	2.88675	10.0000	.000000	70/05/07	70/08/01
31616	FEC COLI	MFM-FCBR	/100ML	6	21.8333	990.966	31.4796	1.44181	12.8515	77.0000	1.00000	70/05/13	70/05/28
31673	FECSTREP	MFKEAGAR	/100ML	12	11.0000	271.454	16.4759	1.49781	4.75617	57.0000	1.00000	70/05/13	70/08/11
32730	PHENOLS		UG/L	6	53.1667	1162.97	34.3943	.646915	14.0414	93.0000	3.00000	70/07/25	70/08/11
70507	PHOS-T	ORTHO	MG/L P	1	1.80000					1.80000	1.80000	70/05/07	70/05/07
71900	MERCURY	HG,TOTAL	UG/L	4	.036000	.000474	.021772	.604765	.010886	.060000	.009000	70/05/07	70/08/01
				5	3.00000	6.59704	2.56847	.697955	1.14965	7.40000	.400000	70/05/07	71/04/06

STORET DATE 02/11/74

571006
44 57 24.0 110 40 47.0 3
GARDINER RIVER ABOVE MAMMOTH
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 003500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	16	5.78125	19.8323	4.46456	.508419	1.11614	16.0000	1.00000	70/05/07	70/08/11
00020	AIR	TEMP	CENT	16	13.6562	35.4239	9.24251	.676797	2.31063	28.0000	3.00000	70/05/07	70/08/11
00060	STREAM	FLOW	CFS	2	158.500	312.500	17.6777	.104233	12.5000	162.000	157.000	70/07/22	70/08/01
00070	TURB	JKSN	JTU	6	5.00000	19.6280	4.43035	1.47676	1.80866	12.0000	.800000	70/05/07	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	4	137.750	1476.92	38.4307	.204691	19.2153	245.000	163.000	70/05/07	70/08/01
00300	DO		MG/L	4	8.72499	.335937	.579601	.066430	.289801	9.50000	8.10000	70/05/07	70/08/01
00310	BOD	5 DAY	MG/L	4	.900000	.386666	.621625	.690917	.310812	1.60000	.200000	70/05/14	70/07/28
00315	COD	5 DAY	MG/L	4	1.20000	.300002	.547724	.456437	.273862	1.90000	.600000	70/05/14	70/07/28
00400	PH		SU	4	7.42500	.029170	.170791	.023002	.085396	7.60000	7.20000	70/05/07	70/08/01
00403	LAB	PH	SU	4	7.43999	.085052	.291638	.038885	.097212	7.90000	7.10000	70/05/07	70/08/11
00410	T ALK	CACO3	MG/L	6	73.3333	277.071	16.6454	.212495	6.79547	105.000	64.0000	70/05/07	70/08/01
00500	RESIDUE	TOTAL	MG/L	4	165.750	595.583	29.9263	.180551	14.9631	205.000	140.000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	4	148.750	1592.25	39.9030	.268256	19.9515	205.000	112.000	70/05/07	70/08/01
00610	NH3-N	TOTAL	MG/L	4	.015000	.000100	.010000	.666667	.005000	.020000	.000000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.090000	.011400	.106771	1.18634	.053385	.250000	.030000	70/05/07	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.042500	.001292	.035940	.845642	.017970	.090000	.010000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.020000	.000367	.008165	.408248	.004082	.030000	.010000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	6.17500	24.2492	4.92435	.797466	2.46218	13.0000	1.30000	70/05/07	70/08/01
00915	CALCIUM	CA,DISS	MG/L	4	20.5000	5.66667	2.38046	.116121	1.19024	24.0000	19.0000	70/05/07	70/08/01
00925	MAGNSIUM	MG,DISS	MG/L	3	4.66667	4.33334	2.08167	.446072	1.20185	7.00000	3.00000	70/05/27	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	6.34994	12.3501	3.51427	.553428	1.75713	9.70000	1.40000	70/05/07	70/08/01
00935	POTSSIUM	K,DISS	MG/L	4	2.40000	1.30000	1.14018	.475074	.570086	3.50000	.800000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	3	8.66667	4.33340	2.08168	.312252	1.20186	9.00000	5.00000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	17.9500	129.077	11.3612	.632936	5.68060	34.0000	9.80000	70/05/07	70/08/01
00950	FLUORIDE	F,DISS	MG/L	4	.625000	.482499	.694622	.841966	.347311	1.40000	.000000	70/05/07	70/08/01
00955	SILICA	DISSOLVED	MG/L	2	26.0000	2.00000	1.41421	.054393	1.00000	27.0000	25.0000	70/07/22	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	517.500	302558	550.053	1.06290	275.026	1300.00	100.000	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	25.0000	1100.00	33.1662	1.32665	16.5831	70.0000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	.005000	.000033	.005773	1.15470	.002887	.010000	.000000	70/05/07	70/08/01
31501	TOT COLI	MFIMENDO	/100ML	6	9.66667	243.067	15.5906	1.61282	6.36483	40.0000	1.00000	70/05/13	70/08/28
31616	FEC COLI	MFM-FCBR	/100ML	12	8.00000	140.364	11.8475	1.48094	3.42008	40.0000	1.00000	70/05/13	70/08/11
31673	FECSTREP	MFKFSGAR	/100ML	6	20.3333	190.267	13.7937	.678380	5.63127	40.0000	3.00000	70/07/25	70/08/11
70507	PHOS-T	ORTHO	MG/L P	4	.003750	.000039	.006238	1.66355	.003119	.013000	.000000	70/05/07	70/08/01
71900	MERCURY	HG,TOTAL	UG/L	1	.400000					.400000	.400000	71/04/06	71/04/06

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MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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MILES 1149.60

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	11	7.91818	4.81367	2.96874	.379726	.895122	14.0000	4.00000	70/05/07	70/08/11
00020	AIR	TEMP	CENT	11	16.3182	19.9636	4.46309	.265670	1.34718	23.0000	9.00000	70/05/07	70/08/11
00060	STREAM	FLOW	CFS	3	69.9333	54.5733	7.38730	.106241	4.26506	78.0000	64.4000	70/05/24	70/08/02
00070	TURB	JKSN	JTU	6	1.30000	1.38400	1.17643	.904950	.480277	3.40000	.400000	70/05/07	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	4	71.7500	140.917	11.8708	.165447	5.93542	89.0000	62.0000	70/05/07	70/08/02
00301	DO		MG/L	4	9.07500	.439258	.699470	.077077	.349735	10.0000	8.30000	70/05/07	70/08/02
00310	BOD	2 DAY	MG/L	2	.250000	.045000	.212132	.848529	.150000	.400000	.100000	70/07/26	70/07/28
00310	BOD	5 DAY	MG/L	2	.600000	.080000	.282843	.471405	.200000	.800000	.400000	70/07/26	70/07/28
00400	PH		SU	4	7.57500	.122553	.350076	.046215	.175038	8.00000	7.20000	70/05/07	70/08/02
00403	LAB	PH	SU	7	7.35714	.106293	.326010	.044312	.123220	7.90000	6.90000	70/05/07	70/08/11
00410	T ALK	CACO3	MG/L	6	32.5000	53.9000	7.34166	.225897	2.99722	47.0000	26.0000	70/05/07	70/08/02
00500	RESIDUE	TOTAL	MG/L	4	141.000	6532.66	80.8249	.573226	40.4124	259.000	81.0000	70/05/07	70/08/02
00515	RESIDUE	DISS-105	C MG/L	4	101.500	1125.67	33.5509	.330551	16.7755	150.000	79.0000	70/05/07	70/08/02
00610	NH3-N	TOTAL	MG/L	4	.012500	.000025	.005000	.400000	.002500	.020000	.010000	70/05/07	70/08/02
00625	TOT KJEL	N	MG/L	4	.102500	.003292	.091059	.888376	.045529	.230000	.020000	70/05/07	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	4	.020000	.000200	.014142	.707107	.007071	.040000	.010000	70/05/07	70/08/02
00665	PHOS-T	P-WET	MG/L	4	.075000	.009367	.096781	1.29042	.048391	.220000	.020000	70/05/07	70/08/02
00680	T ORG C	C	MG/L	4	3.40000	3.32666	1.82391	.536445	.911957	5.10000	1.10000	70/05/07	70/08/02
00915	CALCIUM	CA,DISS	MG/L	4	6.32500	4.64920	2.15620	.340902	1.07810	9.50000	4.80000	70/05/07	70/08/02
00925	MGNSIUM	MG,DISS	MG/L	4	2.60000	.793330	.890691	.342573	.445345	3.60000	1.80000	70/05/07	70/08/02
00930	SODIUM	NA,DISS	MG/L	4	4.62500	.769211	.877047	.189632	.438523	5.60000	3.50000	70/05/07	70/08/02
00935	PTSSIUM	K,DISS	MG/L	4	1.32500	.235835	.485629	.366512	.242814	1.80000	.700000	70/05/07	70/08/02
00940	CHLORIDE	CL	MG/L	4	1.15000	1.55667	1.24766	1.08493	.623832	3.00000	.400000	70/05/07	70/08/02
00945	SULFATE	SO4	MG/L	4	6.72499	9.82265	3.13411	.466039	1.56706	10.0000	3.80000	70/05/07	70/08/02
00950	FLUORIDE	F,DISS	MG/L	4	1.20000	.106668	.326601	.272168	.163301	1.60000	.800000	70/05/07	70/08/02
00955	SILICA	DISOLVED	MG/L	2	33.0000	.000000	.000000		.000000	33.0000	33.0000	70/07/22	70/08/02
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/02
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/02
01045	IRON	TOTAL	UG/L	4	100.000	15000.0	122.474	1.22474	61.2372	250.000	.000000	70/05/07	70/08/02
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/02
01055	MANGNESE	MN	UG/L	4	7.50000	225.000	15.0000	2.00000	7.50000	30.0000	.000000	70/05/07	70/08/02
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/02
31501	TOT COLI	MFI4ENDO	/100ML	1	31.0000					31.0000	31.0000	70/05/28	70/05/28
31616	FEC COLI	MEM-FCBR	/100ML	7	2.42857	3.61906	1.90238	.783334	.719033	6.00000	1.00000	70/05/28	70/08/11
31673	FECSTREP	MEKFAGAR	/100ML	6	14.6667	28.6667	5.35413	.365055	2.18582	22.0000	9.00000	70/07/25	70/08/11
70507	PHOS-T	ORTHO	MG/L P	4	.021500	.000404	.020091	.934487	.010046	.050000	.004000	70/05/07	70/08/02

START DATE 70/11/28

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SLOUGH CREEK ABOVE CAMP,FOOD
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
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INDEX 1021000
MILES 1147.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	10	10.5000	14.2222	3.77124	.359165	1.19257	14.0000	3.00000	70/05/24	70/08/11
00020	AIR	TEMP	CENT	10	10.9000	15.6558	3.95674	.234127	1.25123	24.0000	11.0000	70/05/24	70/08/11
00070	TURB	JKSN	JTU	5	1.72000	4.98700	2.23316	1.29835	.998699	5.70000	.400000	70/05/24	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	3	126.333	729.352	27.0065	.213772	15.5922	153.000	99.0000	70/05/24	70/08/02
00300	DO		MG/L	3	8.66666	.813315	.901950	.104071	.520741	9.60000	7.60000	70/05/24	70/08/02
00304	BOD	2 DAY	MG/L	2	.450000	.005000	.070711	.157135	.050000	.500000	.400000	70/07/26	70/07/28
00310	BOD	5 DAY	MG/L	2	.650000	.045000	.212134	.326360	.150002	.800000	.500000	70/07/26	70/07/28
00400	PH		SU	3	7.60000	.130150	.360763	.047469	.208287	8.00000	7.30000	70/05/24	70/08/02
00403	LAB	PH	SU	6	7.69999	.064062	.253106	.032871	.103330	8.00000	7.30000	70/05/24	70/08/11
00410	T ALK	CACO3	MG/L	5	66.4000	93.3047	9.65944	.145473	4.31983	76.0000	51.0000	70/05/24	70/08/02
00500	RESIDUE	TOTAL	MG/L	3	105.000	84.0000	9.16515	.087287	5.29150	113.000	95.0000	70/05/24	70/08/02
00515	RESIDUE	DISS-105	C MG/L	3	65.3333	1396.34	36.8285	.563701	21.2629	90.0000	23.0000	70/05/24	70/08/02
00610	NH3-N	TOTAL	MG/L	3	.013333	.000033	.005773	.433012	.003333	.020000	.010000	70/05/24	70/08/02
00625	TOT KJEL	N	MG/L	3	.240000	.038400	.414316	1.30969	.181475	.630000	.020000	70/05/24	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	3	.010000	.000300	.017321	1.73205	.010000	.030000	.000000	70/05/24	70/08/02
00665	PHOS-T	P-WET	MG/L	3	.060000	.001300	.036056	.600925	.020817	.090000	.020000	70/05/24	70/08/02
00680	T ORG C	C	MG/L	2	8.20000	28.8501	5.37402	.655369	3.80001	12.0000	4.40000	70/05/24	70/08/02
00915	CALCIUM	CA,DISS	MG/L	3	15.0000	12.0000	3.46410	.230940	2.00000	17.0000	11.0000	70/05/24	70/08/02
00925	MAGNSIUM	MG,DISS	MG/L	3	4.40000	1.92000	1.38564	.314918	.800000	6.00000	3.60000	70/05/24	70/08/02
00930	SODIUM	NA,DISS	MG/L	3	2.06667	.063336	.251660	.139684	.166670	2.40000	1.60000	70/05/24	70/08/02
00935	POTSSIUM	K,DISS	MG/L	3	1.70000	.030002	.173210	.144342	.100003	1.40000	1.10000	70/05/24	70/08/02
00940	CHLORIDE	CL	MG/L	3	.333333	.023333	.152752	.458257	.088192	.500000	.200000	70/05/24	70/08/02
00945	SULFATE	SO4	MG/L	3	5.96666	13.3034	3.64738	.611294	2.10582	10.0000	2.90000	70/05/24	70/08/02
00950	FLUORIDE	F,DISS	MG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/24	70/08/02
00955	SILICA	DISSOLVED	MG/L	2	15.0000	2.00000	1.41421	.094281	1.00000	16.0000	14.0000	70/07/22	70/08/02
01005	BARIUM	BA,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/24	70/08/02
01040	COPPER	CU-DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/24	70/08/02
01045	IRON	TOTAL	UG/L	3	233.333	163333	404.145	1.73205	233.333	700.000	.000000	70/05/24	70/08/02
01049	LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/24	70/08/02
01055	MANGNESE	MN	UG/L	3	6.66667	133.333	11.5470	1.73205	6.66667	20.0000	.000000	70/05/24	70/08/02
01090	ZINC	ZN,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/24	70/08/02
31501	TOT COLI	MFIMENDO	/100ML	1	60.0000					60.0000	60.0000	70/05/26	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	7	10.4286	181.619	13.4766	1.29226	5.09366	40.0000	1.00000	70/05/28	70/08/11
31673	FECSTREP	MFKFBGAR	/100ML	6	23.8333	107.367	10.3618	.434761	4.23019	42.0000	13.0000	70/07/25	70/08/11
70507	PHOS-T	ORTHO	MG/L P	3	.011333	.000065	.008083	.713197	.004667	.020000	.004000	70/05/24	70/08/02

STORET DATE 72/12/23

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SLOUGH CREEK BELOW CAMPBELL
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MISSOURI RIVER
YELLOWSTONE RIVER
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INDEX 1021500
MILES 1145.00

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	14	9.23571	16.7967	4.09838	.441364	1.09534	15.0000	2.00000	70/05/09	70/08/11
00020	AIR	TEMP	CENT	14	15.3571	60.5627	7.80145	.508002	2.08503	34.0000	4.00000	70/05/09	70/08/11
00060	STREAM	FLOW	CFS	1	206.000					206.000	206.000	70/07/27	70/07/27
00070	TURB	JKSN	JTU	5	.860000	.043000	.207365	.241122	.092736	1.10000	.600000	70/05/09	70/08/02
00095	CONDUCTVY	AT 25C	MICROMHO	3	141.000	741.000	27.2213	.193059	15.7162	166.000	112.000	70/05/09	70/08/02
00300	DO		MG/L	3	9.13333	.703361	.838666	.091825	.484204	10.1000	8.60000	70/05/09	70/08/02
00304	BOD	5 DAY	MG/L	4	.674999	.242500	.492443	.729545	.246221	1.10000	.200000	70/05/14	70/07/26
00310	BOD	5 DAY	MG/L	4	.699999	.020000	.141423	.157137	.070711	1.10000	.800000	70/05/14	70/07/28
00400	PH		SU	3	7.63333	.063354	.251703	.032974	.145321	7.90000	7.40000	70/05/09	70/08/02
00403	LAB	PH	SU	8	7.80000	.074323	.272623	.034952	.096387	8.20000	7.40000	70/05/09	70/08/11
00410	T ALK	CACO3	MG/L	5	69.2000	225.205	15.0068	.216862	6.71126	95.0000	57.0000	70/05/09	70/08/02
00500	RESIDUE	TOTAL	MG/L	3	137.667	1352.33	36.7743	.267126	21.2317	178.000	106.000	70/05/09	70/08/02
00515	RESIDUE	DISS-105	C MG/L	3	101.000	589.000	24.2693	.240290	14.0119	116.000	73.0000	70/05/09	70/08/02
00610	NH3-N	TOTAL	MG/L	3	.006667	.000033	.005774	.866026	.003333	.010000	.000000	70/05/09	70/08/02
00625	TOT KJEL	N	MG/L	3	.056667	.008033	.089629	1.58169	.051747	.160000	.000000	70/05/09	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	3	.003333	.000033	.005773	1.73205	.003333	.010000	.000000	70/05/09	70/08/02
00665	PHOS-T	P-WET	MG/L	3	.070000	.001200	.034641	.494873	.020000	.090000	.030000	70/05/09	70/08/02
00680	T ORG C	C	MG/L	3	3.66667	6.96333	2.63881	.719676	1.52352	6.70000	1.90000	70/05/09	70/08/02
00915	CALCIUM	CA,DISS	MG/L	3	18.0667	65.3340	8.08294	.433015	4.66669	28.0000	14.0000	70/05/09	70/08/02
00925	MAGNSIUM	MG,DISS	MG/L	3	3.96667	4.49333	2.11975	.739447	1.22384	4.80000	.000000	70/05/09	70/08/02
00930	SODIUM	NA,DISS	MG/L	3	2.50000	.070000	.264575	.105830	.152752	2.80000	2.30000	70/05/09	70/08/02
00935	POTSSIUM	K,DISS	MG/L	3	1.40000	.010000	.099999	.071428	.057734	1.50000	1.30000	70/05/09	70/08/02
00940	CHLORIDE	CL	MG/L	3	.466666	.213334	.461881	.989744	.266667	1.00000	.200000	70/05/09	70/08/02
00945	SULFATE	SO4	MG/L	3	6.93333	7.21347	2.68579	.387374	1.55064	10.0000	5.00000	70/05/09	70/08/02
00950	FLUORIDE	F,DISS	MG/L	3	.033333	.003333	.057735	1.73205	.033333	.100000	.000000	70/05/09	70/08/02
00955	SILICA	DISOLVED	MG/L	2	17.5000	.500000	.707107	.040406	.500000	18.0000	17.0000	70/07/22	70/08/02
01005	BARIUM	BA,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01040	COPPER	CU-DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01045	IRON	TOTAL	UG/L	3	73.3333	4133.33	64.2910	.876696	37.1184	120.000	.000000	70/05/09	70/08/02
01049	LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01055	MANGNESE	MN	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01090	ZINC	ZN,DISS	UG/L	3	2.00000	12.0000	3.46410	1.73205	2.00000	6.00000	.000000	70/05/09	70/08/02
31501	TOT COLI	MFIMENDO	/100ML	5	13.8000	207.701	14.4118	.727370	6.44516	37.0000	3.00000	70/05/13	70/05/17
31616	FEC COLI	MFM-FCBR	/100ML	11	9.36364	112.055	10.5856	1.13050	3.19167	36.0000	1.00000	70/05/13	70/08/11
31673	FECSTREP	MFKFBGAR	/100ML	6	21.0000	112.800	10.6207	.505749	4.33590	36.0000	8.00000	70/07/25	70/08/11
70507	PHOS-T	ORTHO	MG/L P	3	.014667	.000085	.009238	.629836	.005333	.020000	.004000	70/05/09	70/08/02

STOR T DATE 72/11/23

STATION
44 5' 04.0 110 11 27.0 3
LAMAR R. ABOVE SODA BUTTE INFLOW
00 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117438 77777777
0000

INDEX 1027555
MILES 1164.00

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	3	11.1250	11.6250	3.40955	.306476	1.20546	14.0000	8.00000	70/05/09	70/08/02
00020	AIR	TEMP	CENT	3	14.9444	14.777c	3.84419	.257232	1.28140	20.0000	7.00000	70/05/09	70/08/02
00060	STREAM	FLOW	CFS	1	284.000					284.000	284.000	70/08/02	70/08/02
00070	TURB	JKSN	JTU	5	26.6400	2201.69	46.9221	1.76134	20.9842	110.000	1.40000	70/05/09	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	5	86.0000	121.000	11.0000	.127907	6.35085	97.0000	75.0000	70/05/09	70/08/02
00300	DO		MG/L	3	9.39999	.790161	.889510	.094565	.513212	10.4000	8.70000	70/05/09	70/08/02
00310	BOD	5 DAY	MG/L	2	.250000	.005000	.070710	.282841	.050000	.300000	.200000	70/07/26	70/07/28
00400	PH		SU	2	.800000	.000001	.000977	.001221	.000691	.800000	.800000	70/07/26	70/07/28
00403	LAB	PH	SU	3	7.83333	.043356	.208225	.027278	.120219	7.80000	7.40000	70/05/09	70/08/02
00410	T ALK	CACO3	MG/L	5	7.10000	.005077	.071256	.010036	.031866	7.20000	7.00000	70/05/09	70/08/02
00500	RESIDUE	TOTAL	MG/L	5	42.2000	34.7012	5.89077	.139592	2.63443	51.0000	35.0000	70/05/09	70/08/02
00515	RESIDUE	DISS-105	C MG/L	3	141.667	5462.35	73.9077	.521702	42.6706	227.000	45.0000	70/05/09	70/08/02
00610	NH3-N	TOTAL	MG/L	3	64.6667	3130.34	55.9494	.865197	32.3024	106.000	1.00000	70/05/09	70/08/02
00625	TOT KJEL	N	MG/L	3	.006667	.000033	.005774	.866026	.003333	.010000	.000000	70/05/09	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	3	.180000	.012400	.111355	.618640	.064291	.260000	.060000	70/05/09	70/08/02
00665	PHOS-T	P-WET	MG/L	3	.020000	.000100	.010000	.500000	.005773	.030000	.010000	70/05/09	70/08/02
00671	T PHOS	P	MG/L	3	.096667	.000633	.025166	.260339	.014530	.120000	.070000	70/05/09	70/08/02
00915	CALCIUM	CA,DISS	MG/L	3	7.36666	19.8235	4.45235	.604392	2.57057	11.0000	2.40000	70/05/09	70/08/02
00920	MAGNSIUM	CACO3	MG/L	3	6.43333	4.03013	2.00752	.308849	1.15904	8.80000	5.10000	70/05/09	70/08/02
00925	MAGNSIUM	MG,DISS	MG/L	1	.100000					.100000	.100000	70/08/02	70/08/02
00930	SODIUM	NA,DISS	MG/L	3	2.66667	1.00333	1.00167	.375625	.578312	3.70000	1.70000	70/05/09	70/08/02
00935	POTSSIUM	K,DISS	MG/L	3	9.23333	1.76333	1.32791	.143817	.766669	10.0000	7.70000	70/05/09	70/08/02
00940	CHLORIDE	CL	MG/L	3	1.06667	.083336	.288680	.270637	.166669	1.40000	.900000	70/05/09	70/08/02
00945	SULFATE	SO4	MG/L	3	1.000000	.760002	.871781	.871781	.503323	2.00000	.400000	70/05/09	70/08/02
00950	FLUORIDE	F,DISS	MG/L	3	13.4667	54.7736	7.40092	.549573	4.27292	22.0000	8.80000	70/05/09	70/08/02
00955	SILICA	DISSLVED	MG/L	2	.150000	.005000	.070711	.471404	.050000	.200000	.100000	70/05/09	70/07/22
01005	BARIUM	BA,DISS	UG/L	2	22.0000	2.00000	1.41421	.064232	1.00000	23.0000	21.0000	70/07/22	70/08/02
01040	COPPER	CU-DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01045	IRON	TOTAL	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01049	LEAD	PB,DISS	UG/L	3	636.666	238034	487.867	.766315	281.682	1200.00	350.000	70/05/09	70/08/02
01055	MANGNESE	MN	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01092	ZINC	ZN,DISS	UG/L	3	20.0000	1200.00	34.6410	1.73205	20.0000	60.0000	.000000	70/05/09	70/08/02
31616	FEC COLI	MFM-FCBR	/100ML	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
31673	FECSTREP	MFKFBGAR	/100ML	5	54.2000	4398.20	66.3190	1.22360	29.6587	170.000	14.0000	70/07/25	70/07/29
70507	PHOS-T	ORTHO	MG/L P	5	50.2000	5076.20	71.2474	1.41927	31.8628	175.000	10.0000	70/07/25	70/07/29
				3	.063667	.000250	.015822	.248518	.009135	.091000	.050000	70/05/09	70/08/02

STORET DATE 72/11/2

STORET
46 55 00.0 110 24 30.0 3
YELLOWSTONE R. AT TONGUE JUNCTION
56 MONTANA
MISSOURI RIVER
YELLOWSTONE RIVER
1117MAR 77777777
0000

INDEX 102100
MILES 1142.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	14	11.0429	18.0165	4.24458	.364565	1.13441	16.5000	6.00000	70/05/09	70/08/02
00020	AIR	TEMP	CENT	14	14.3929	45.6223	6.75443	.469290	1.80520	23.0000	4.00000	70/05/09	70/08/02
00070	TURB	JKSN	JTU	6	5.55000	27.1669	5.21219	.939135	2.12787	14.0000	.900000	70/05/09	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	4	122.750	344.916	29.0674	.236802	14.5337	166.000	104.000	70/05/09	70/08/02
00300	DO		MG/L	4	8.57500	.429281	.655195	.076408	.327597	9.40000	8.00000	70/05/09	70/08/02
00304	BOD	2 DAY	MG/L	4	.825000	.255833	.505799	.613090	.252900	1.40000	.400000	70/05/14	70/07/28
00310	BOD	5 DAY	MG/L	4	1.17500	.149167	.386222	.328700	.193111	1.60000	.800000	70/05/14	70/07/28
00400	PH		SU	4	7.37500	.202250	.450056	.061025	.225028	7.90000	6.80000	70/05/09	70/08/02
00403	LAB	PH	SU	8	7.23749	.065534	.255997	.035371	.090508	7.60000	6.80000	70/05/09	70/08/02
00410	T ALK	CACO3	MG/L	6	33.5000	47.9000	6.92098	.206596	2.82548	47.0000	27.0000	70/05/09	70/08/02
00500	RESIDUE	TOTAL	MG/L	4	116.250	2324.92	48.2174	.414773	24.1087	162.000	49.0000	70/05/09	70/08/02
00515	RESIDUE	DISS-105	C MG/L	4	75.7500	3264.25	57.1336	.754239	28.5668	134.000	2.00000	70/05/09	70/08/02
00610	NH3-N	TOTAL	MG/L	4	.117500	.009425	.097082	.826233	.048541	.240000	.030000	70/05/09	70/08/02
00625	TOT KJEL	N	MG/L	4	.230000	.040933	.202320	.879651	.101160	.460000	.060000	70/05/09	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	4	.080000	.004067	.063770	.797132	.031885	.170000	.030000	70/05/09	70/08/02
00665	PHOS-T	P-WET	MG/L	4	.122500	.008625	.092871	.758130	.046435	.240000	.030000	70/05/09	70/08/02
00680	T ORG C	C	MG/L	4	2.87500	2.71583	1.64798	.573210	.823989	4.40000	1.40000	70/05/09	70/08/02
00915	CALCIUM	CA,DISS	MG/L	4	5.92500	1.32250	1.15000	.194093	.575000	7.30000	4.50000	70/05/09	70/08/02
00925	MGNSIUM	MG,DISS	MG/L	4	2.22500	.169168	.434935	.195476	.217467	2.80000	1.80000	70/05/09	70/08/02
00930	SODIUM	NA,DISS	MG/L	4	14.5000	32.3333	5.68624	.392154	2.84312	23.0000	11.0000	70/05/09	70/08/02
00935	PTSSIUM	K,DISS	MG/L	4	3.27500	1.06249	1.03077	.314740	.515387	4.80000	2.60000	70/05/09	70/08/02
00940	CHLORIDE	CL	MG/L	4	8.25000	20.2500	4.50000	.545454	2.25000	15.0000	6.00000	70/05/09	70/08/02
00945	SULFATE	SO4	MG/L	4	18.6250	142.562	11.9400	.641071	5.96998	35.0000	9.50000	70/05/09	70/08/02
00950	FLUORIDE	F,DISS	MG/L	4	.550000	.003334	.057738	.104979	.028869	.600000	.500000	70/05/09	70/08/02
00955	SILICA	DISOLVED	MG/L	2	13.0000	.000000	.000000		.000000	13.0000	13.0000	70/07/22	70/08/02
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01045	IRON	TOTAL	UG/L	4	367.500	10225.0	101.119	.275153	50.5594	450.000	220.000	70/05/09	70/08/02
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01055	MANGNESE	MN	UG/L	4	15.0000	300.000	17.3205	1.15470	8.66026	30.0000	.000000	70/05/09	70/08/02
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
31501	TOT COLI	MFIMENDO	/100ML	5	10.5000	271.700	16.4833	1.52623	7.37157	40.0000	1.00000	70/05/13	70/05/17
31616	FEC COLI	MFM-FCBR	/100ML	10	16.4000	763.377	27.6293	1.68471	8.73715	89.0000	1.00000	70/05/13	70/07/29
31673	FECSTREP	MFKFAGAR	/100ML	5	43.8000	1489.70	38.5967	.881203	17.2609	110.000	16.0000	70/07/25	70/07/29
70507	PHOS-T	ORTHO	MG/L P	4	.103750	.008540	.092410	.849746	.046205	.220000	.005000	70/05/09	70/08/02

STORET DATE 72/11/23

571012
44 53 45.0 110 23 30.0 3
TOWER CR. NEAR TOWER FALLS
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	11	8.40909	11.3409	3.36763	.525446	1.01536	10.0000	.000000	70/05/09	70/08/11
00010	AIR	TEMP	CENT	11	15.6182	74.3137	8.62054	.544977	2.59919	33.0000	3.00000	70/05/09	70/08/11
00070	TURB	JKSN	JTU	6	6.09996	173.965	13.1897	2.16225	5.38467	33.0000	.300000	70/05/09	70/08/02
00095	CONDUCTVY	AT 25C	MICROMHO	4	69.7500	119.417	10.9049	.156342	5.45245	86.0000	63.0000	70/05/09	70/08/02
00300	OX		MG/L	4	9.44999	.336751	.580303	.061408	.290151	10.1000	8.70000	70/05/09	70/08/02
00301	BOD	2 DAY	MG/L	2	.150000	.005000	.070711	.471404	.050000	.200000	.100000	70/07/26	70/07/28
00310	BOD	5 DAY	MG/L	2	.500000	.020000	.141421	.282843	.100000	.600000	.400000	70/07/26	70/07/28
00400	PH		SU	4	7.60000	.180028	.424297	.055829	.212149	8.20000	7.20000	70/05/09	70/08/02
00403	LAB	PH	SU	7	7.24285	.069539	.263703	.036409	.099670	7.60000	6.90000	70/05/09	70/08/11
00410	T ALK	CACO3	MG/L	6	33.1667	35.7680	5.98063	.180321	2.44158	45.0000	28.0000	70/05/09	70/08/02
00500	RESIDUE	TOTAL	MG/L	4	83.7500	104.250	10.2105	.121914	5.10514	96.0000	74.0000	70/05/09	70/08/02
00515	RESIDUE	DISS-105	C MG/L	4	60.2500	484.916	22.0208	.365491	11.0104	83.0000	31.0000	70/05/09	70/08/02
00610	NH3-N	TOTAL	MG/L	4	.010000	.000067	.008165	.816496	.004082	.020000	.000000	70/05/09	70/08/02
00625	TOT KJEL	N	MG/L	4	.060000	.005433	.073708	1.23397	.040104	.180000	.010000	70/05/09	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	4	.017500	.000092	.009574	.547101	.004787	.030000	.010000	70/05/09	70/08/02
00665	PHOS-T	P-WET	MG/L	4	.040000	.000735	.027080	.677003	.013540	.080000	.020000	70/05/09	70/08/02
00680	T ORG C	C	MG/L	4	3.55000	8.04000	2.84429	.801209	1.42215	7.40000	.800000	70/05/09	70/08/02
00915	CALCIUM	CA,DISS	MG/L	4	5.80000	.733337	.857950	.149646	.433975	6.80000	4.70000	70/05/09	70/08/02
00925	MAGNESIUM	MG,DISS	MG/L	4	2.02500	.148170	.386225	.190728	.193113	2.40000	1.50000	70/05/09	70/08/02
00930	SODIUM	NA,DISS	MG/L	4	5.27500	1.59916	1.26063	.238982	.630314	7.10000	4.30000	70/05/09	70/08/02
00935	POTASSIUM	K,DISS	MG/L	4	2.32500	3.20917	1.79141	.605131	.895708	4.90000	1.10000	70/05/09	70/08/02
00940	CHLORIDE	CL	MG/L	4	2.22500	6.86917	2.62091	1.17794	1.31046	6.00000	.400000	70/05/09	70/08/02
00945	SULFATE	SO4	MG/L	4	9.17500	4.02323	2.00729	.325066	1.00365	8.60000	3.70000	70/05/09	70/08/02
00950	FLUORIDE	F,DISS	MG/L	4	.550000	.030000	.173206	.314920	.086603	.800000	.400000	70/05/09	70/08/02
00955	SILICA	DISSOLVED	MG/L	2	29.5000	4.50000	2.12132	.071909	1.50000	31.0000	28.0000	70/07/22	70/08/02
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01045	IRON	TOTAL	UG/L	4	155.000	37433.3	193.477	1.24824	96.7385	400.000	.000000	70/05/09	70/08/02
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01055	MANGANESE	MN	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/09	70/08/02
31501	TOT COLI	MFIMENDO	/100ML	1	46.0000					46.0000	46.0000	70/05/28	70/05/28
31616	FEC COLI	MFM-FCBR	/100ML	7	3.14286	12.4762	3.53217	1.12387	1.33503	10.0000	1.00000	70/05/26	70/08/11
31673	FECSTREP	MFKFBSA-	/100ML	6	11.3333	325.467	18.0407	1.59183	7.36508	48.0000	2.00000	70/07/25	70/08/11
70507	PHOS-T	ORTHO	MG/L P	4	.017500	.000051	.007141	.408031	.003571	.023000	.007000	70/05/09	70/08/02

STORET DATE 72/11/29

571013
46 42 20.0 110 30 00.0 3
YELLOWSTONE R. AT THE UPPER FALL
00 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1317MBR 77777777
0000

INDEX 1021000
MILES 1146.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	15	9.20667	47.0310	6.85791	.740062	1.77070	19.0000	.000000	70/05/07	70/08/19
00011	AIR	TEMP	CENT	15	12.6667	69.0953	8.31236	.656239	2.14624	26.0000	.000000	70/05/07	70/08/19
00070	TURB	JKSN	JTU	4	2.72500	5.22917	2.28674	.839170	1.14337	4.90000	.700000	70/05/07	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	4	108.750	721.583	26.8623	.247010	13.4312	137.000	73.0000	70/05/07	70/08/01
00300	DO		MG/L	4	8.24999	.216878	.465702	.056449	.232851	8.70000	7.80000	70/05/07	70/08/01
00304	BOD	2 DAY	MG/L	3	1.23333	.303335	.550756	.446561	.317980	1.60000	.600000	70/05/14	70/08/10
00310	BOD	5 DAY	MG/L	3	1.46667	.173333	.416332	.283863	.240370	1.80000	1.00000	70/05/14	70/08/10
00400	PH		SU	4	7.05000	.096669	.310917	.044102	.155459	7.50000	6.80000	70/05/07	70/08/01
00403	LAB	PH	SU	9	7.09999	.105041	.324101	.045648	.108034	7.60000	6.50000	70/05/07	70/08/17
00410	T ALK	CACO3	MG/L	5	31.0000	100.000	10.0000	.322581	4.47214	40.0000	14.0000	70/05/07	70/08/17
00500	RESIDUE	TOTAL	MG/L	4	172.250	9889.58	98.4357	.571470	49.2178	319.000	112.000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	4	101.000	810.000	28.4605	.281787	14.2302	143.000	80.0000	70/05/07	70/08/01
00610	NH3-N	TOTAL	MG/L	4	.015000	.000167	.012910	.860663	.006455	.030000	.000000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.260000	.007667	.087560	.336770	.043780	.350000	.140000	70/05/07	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.007500	.000092	.009574	1.27657	.004787	.020000	.000000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.042500	.000492	.022174	.521731	.011087	.070000	.020000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	6.87500	24.5092	4.95067	.720099	2.47534	14.0000	2.70000	70/05/07	70/08/01
00915	CALCIUM	CA,DISS	MG/L	4	4.52500	2.72919	1.65202	.365089	.826013	6.00000	2.20000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	2.20000	.580002	.761578	.346172	.380789	2.80000	1.10000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	11.3500	7.07502	2.66023	.222613	1.33011	15.0000	8.80000	70/05/07	70/08/01
00935	POTSSIUM	K,DISS	MG/L	4	2.37500	.122492	.349989	.117643	.174995	3.40000	2.60000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	4	6.45000	21.0767	4.59094	.711774	2.29547	12.0000	.800000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	16.0250	49.5360	7.03818	.439200	3.51909	25.0000	9.10000	70/05/07	70/08/01
00950	FLUORIDE	F,DISS	MG/L	4	.750000	.096667	.310913	.414550	.155456	1.20000	.500000	70/05/07	70/08/01
00955	SILICA	DISOLVED	MG/L	2	13.0000	2.00000	1.41421	.108786	1.00000	14.0000	12.0000	70/07/19	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	455.000	90433.3	300.721	.660926	150.361	850.000	120.000	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	50.0000	3333.33	57.7350	1.15470	28.8675	100.000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	2.50000	25.0000	5.00000	2.00000	2.50000	10.0000	.000000	70/05/07	70/08/01
31501	TOT COLI	MFI MENDO	/100ML	6	52.8333	6473.77	92.0531	1.74233	37.5805	240.000	7.00000	70/05/13	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	12	16.4167	1109.54	33.3097	2.02902	9.61569	120.000	2.00000	70/05/13	70/08/19
31673	FECSTREP	MFKFBGAF	/100ML	6	19.5000	236.300	15.3721	.788310	6.27561	42.0000	1.00000	70/08/10	70/08/19
70507	PHOS-T	ORTHO	MG/L P	4	.018500	.000090	.009469	.511853	.004735	.030000	.007000	70/05/07	70/08/01

STORET DATE 70/11/04

STORET
+4 3E 51.0 110 27 45.0 3
YELLOWSTONE R. I. HAYDEN VALLEY
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MER 77777777
0000

INDEX 102500
MILES 1145.40
PARAMETER

				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	10	11.4000	37.1556	6.09554	.534696	1.92758	18.0000	.000000	70/05/07	70/08/19
00020	AIR	TEMP	CENT	10	16.1000	55.8781	7.47517	.464296	2.36386	26.0000	6.00000	70/05/07	70/08/19
00021	TURB	JKSN	JTU	4	2.30000	3.10000	1.76068	.765513	.880340	4.40000	.700000	70/05/07	70/08/01
00095	CND,ELTVY	AT 25C	MICROMHO	4	102.250	2436.25	49.3584	.482722	24.6792	168.000	49.0000	70/05/07	70/08/01
00300	DO		MG/L	4	9.17500	.209310	.457504	.055964	.228752	8.70000	7.70000	70/05/07	70/08/01
00304	BOD	2 DAY	MG/L	1	.400000					.40000	.400000	70/08/10	70/08/10
00310	BOD	5 DAY	MG/L	1	1.00000					1.00000	1.00000	70/08/10	70/08/10
00400	PH		SU	4	6.87500	.075692	.275455	.040071	.137743	7.20000	6.60000	70/05/07	70/08/01
00403	LAB	PH	SU	7	7.08929	.040039	.200095	.028183	.075630	7.40000	6.60000	70/05/07	70/08/17
00410	T ALK	CACO3	MG/L	5	31.8000	67.7012	8.22807	.258744	3.67971	41.0000	20.0000	70/05/07	70/08/17
00500	RESIDUE	TOTAL	MG/L	4	173.250	18210.9	134.946	.778919	67.4739	353.000	54.0000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	4	101.250	4034.92	63.5210	.627368	31.7605	193.000	47.0000	70/05/07	70/08/01
00610	NH3-N	TOTAL	MG/L	4	.017500	.000092	.009574	.547101	.004787	.030000	.010000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.267500	.026092	.161529	.603846	.080765	.500000	.130000	70/05/07	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.007500	.000025	.005000	.666667	.002500	.010000	.000000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.060000	.001800	.042426	.707107	.021213	.110000	.020000	70/05/07	70/08/01
00680	TOR, C	C	MG/L	3	6.83333	.723427	.850545	.124470	.491062	7.70000	6.00000	70/05/07	70/08/01
00915	CALCIUM	CA,DISS	MG/L	4	8.05000	7.10333	2.66521	.440530	1.33260	9.30000	5.10000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	2.87500	1.32917	1.15289	.401007	.576447	4.40000	1.60000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	9.07500	23.5625	4.85348	.532615	2.41674	15.0000	3.30000	70/05/07	70/08/01
00935	POTSSIUM	K,DISS	MG/L	4	2.75000	.856874	.925567	.336570	.462783	4.00000	2.00000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	4	4.75000	6.25000	2.50000	.526316	1.25000	8.00000	2.00000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	15.3500	62.4102	7.90001	.495298	3.95000	26.0000	7.60000	70/05/07	70/08/01
00951	FLUORIDE	F,DISS	MG/L	4	1.20000	1.34000	1.15758	.964654	.578792	2.90000	.300000	70/05/07	70/08/01
00955	SILICA	DISOLVED	MG/L	2	31.0000	832.000	28.6985	.958016	21.0000	52.0000	10.0000	70/07/19	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	265.000	17366.7	131.783	.497293	65.8913	400.000	120.000	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	32.5000	1556.33	39.4757	1.21464	19.7378	80.0000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	.017500	.001225	.035000	2.00000	.017500	.070000	.000000	70/05/07	70/08/01
31501	TOT COLI	MFIMENGB	/100ML	1	520.000					520.000	520.000	70/05/26	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	7	10.4286	22.2356	4.72076	.452678	1.78429	19.0000	4.00000	70/05/26	70/08/19
31673	FECSTREP	MFKFBGAR	/100ML	6	27.6667	95.8690	9.79122	.353900	3.99725	46.0000	20.0000	70/08/10	70/08/19
70507	PHOS-T	ORTHO	MG/L P	4	.028750	.000264	.016235	.564706	.008118	.050000	.011000	70/05/07	70/08/01

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STARTS DATE 72/11/0

571015
44 39 20.0 110 23 10.0 3
YELLOWSTONE R. BELOW FISHING BR.
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
!117MBR 77777777
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INDEX 1021500
MILES 1143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	16	9.15625	64.7573	8.04719	.878874	2.01180	24.0000	.000000	70/05/07	70/08/19
00020	AIR	TEMP	CENT	16	11.8750	71.8500	8.47644	.713805	2.11911	26.0000	.000000	70/05/07	70/08/19
00070	TU-3	JKSN	JTU	4	1.12500	.329166	.573731	.509984	.286866	1.30000	.600000	70/05/07	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	4	83.5000	313.666	17.7106	.212103	8.85532	94.0000	57.0000	70/05/07	70/08/01
00300	DO		MG/L	4	8.19999	1.28678	1.13436	.138337	.567183	9.40000	6.70000	70/05/07	70/08/01
00310	BOD	2 DAY	MG/L	3	.833333	.163334	.404146	.484975	.233334	1.30000	.600000	70/05/14	70/08/10
00310	BOD	5 DAY	MG/L	3	1.000000	.120000	.346411	.346411	.200000	1.20000	.600000	70/05/14	70/08/10
00400	PH		SU	4	7.22499	.042567	.206367	.028563	.103183	7.40000	7.00000	70/05/07	70/08/01
00403	LAB	PH	SU	9	7.32222	.219482	.468490	.063982	.156163	8.50000	7.00000	70/05/07	70/08/17
00410	T ALK	CACO3	MG/L	5	29.0000	23.5000	4.84768	.167161	2.16795	34.0000	21.0000	70/05/07	70/08/17
00500	RESIDUE	TOTAL	MG/L	4	116.250	1512.92	38.8962	.334591	19.4481	167.000	76.0000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	4	70.5000	715.000	26.7395	.379283	13.3697	104.000	41.0000	70/05/07	70/08/01
00610	NH3-N	TOTAL	MG/L	4	.035000	.000433	.020817	.594762	.010408	.060000	.010000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.295000	.002300	.047959	.162573	.023979	.340000	.230000	70/05/07	70/06/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.010000	.000200	.014142	1.41421	.007071	.030000	.000000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.072500	.006292	.079320	1.09407	.039660	.190000	.020000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	3.97500	7.46250	2.73176	.687235	1.36588	7.80000	1.50000	70/05/07	70/08/01
00915	CALCIUM	CA,DISS	MG/L	4	4.42500	1.75584	1.32508	.299454	.662541	5.50000	2.50000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	2.20000	.226669	.476096	.216408	.238049	2.50000	1.50000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	7.65000	3.39004	1.84121	.240680	.920603	9.50000	5.10000	70/05/07	70/06/01
00935	POTSSIUM	K,DISS	MG/L	4	1.82500	.022499	.149998	.082191	.074999	2.00000	1.70000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	4	4.25000	1.58333	1.25831	.296072	.629153	6.00000	3.00000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	10.6250	20.2292	4.49768	.423311	2.24884	17.0000	6.50000	70/05/07	70/08/01
00950	FLUORIDE	F,DISS	MG/L	4	.525000	.009167	.095743	.182368	.047871	.600000	.400000	70/05/07	70/08/01
00955	SILICA	DISSOLVED	MG/L	2	3.00000	.000000	.000000		.000000	8.00000	8.00000	70/07/19	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	212.500	60625.0	283.945	1.33621	141.973	600.000	.000000	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	10.0000	200.000	14.1421	1.41421	7.07107	30.0000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
31501	TOT COLI	MFIMENDO	/100ML	6	3.66667	17.4667	4.17932	1.13981	1.70620	12.0000	1.00000	70/05/13	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	12	6.16667	175.970	13.2654	2.15114	3.82938	48.0000	1.00000	70/05/13	70/08/19
31673	FECSTREP	MFKFBGAR	/100ML	6	105.333	9490.27	97.4180	.924855	39.7707	210.000	4.00000	70/08/10	70/08/19
70507	PHOS-T	ORTHO	MG/L P	4	.026750	.000549	.023429	.875849	.011714	.060000	.005000	70/05/07	70/08/01

STORET DATE 72/11/24

571016
44 33 22.0 110 21 33.0 3
PELICAN CREEK NEAR MOUTH
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1146.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	12	15.4167	41.2197	6.42026	.416529	1.85337	19.0000	1.00000	70/05/07	70/08/15
00020	AIR	TEMP	CENT	11	15.0909	37.5909	6.13556	.407839	1.85597	24.0000	4.00000	70/05/07	70/08/15
00070	TURB	JKSN	JTU	6	12.1167	82.9377	9.04042	.746033	3.93565	28.0000	4.20000	70/05/07	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	4	222.500	7691.66	87.7021	.394167	43.9511	286.000	98.0000	70/05/07	70/08/01
00300	DO		MG/L	4	7.47499	2.88925	1.69978	.227395	.849890	9.10000	5.40000	70/05/07	70/08/01
00304	BOD	2 DAY	MG/L	2	.650000	.045001	.212134	.326360	.150002	.800000	.500000	70/07/31	70/08/02
00310	BOD	5 DAY	MG/L	2	1.30000	.020001	.141426	.108789	.100003	1.40000	1.20000	70/07/31	70/08/02
00400	PH		SU	4	7.12500	.075887	.275476	.038663	.137738	7.40000	6.80000	70/05/07	70/08/01
00403	LAB	PH	SU	8	7.32499	.044992	.212112	.028957	.074993	7.60000	6.90000	70/05/07	70/08/15
00410	T ALK	CACO3	MG/L	6	52.8333	241.770	15.5490	.294302	6.34784	73.0000	31.0000	70/05/07	70/08/02
00500	RESIDUE	TOTAL	MG/L	4	287.750	9036.25	95.0697	.330390	47.5348	420.000	195.000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	4	201.500	7233.66	85.0509	.422089	42.5255	283.000	89.0000	70/05/07	70/08/01
00610	NH3-N	TOTAL	MG/L	4	.105000	.007100	.084261	.802491	.042131	.230000	.050000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.402499	.022292	.149306	.370946	.074653	.580000	.260000	70/05/07	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.090000	.001133	.033665	.374056	.016833	.130000	.050000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.057500	.001292	.035940	.625039	.017970	.090000	.010000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	10.7000	48.1466	6.93878	.648484	3.46939	20.0000	5.20000	70/05/07	70/08/01
00915	CALCIUM	CA,DISS	MG/L	4	10.6500	21.8234	4.67155	.438643	2.33578	16.0000	4.60000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	6.52500	3.27585	1.80993	.277384	.904966	8.80000	4.40000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	21.2500	89.5333	9.46485	.445405	4.73242	29.0000	8.00000	70/05/07	70/08/01
00935	POTSSIUM	K,DISS	MG/L	4	6.02499	3.01592	1.73664	.288239	.868320	7.70000	3.60000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	4	13.0000	44.0000	6.63325	.510250	3.31662	18.0000	4.00000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	51.7500	755.583	27.4879	.531167	13.7439	88.0000	23.0000	70/05/07	70/08/01
00950	FLORIDE	F,DISS	MG/L	4	.175000	.015833	.125831	.719032	.062915	.300000	.000000	70/05/07	70/08/01
00955	SILICA	DISSOLVED	MG/L	2	60.0000	72.0000	8.48528	.169706	6.00000	66.0000	44.0000	70/07/19	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	1950.00	783333	885.061	.453878	442.531	2800.00	1000.00	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	142.500	5356.33	73.2005	.513639	36.6003	220.000	80.0000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
31501	TOT COLI	MFIMENDO	/100ML	1	200.000					200.000	200.000	70/05/26	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	8	90.7500	1816.21	42.6405	.840207	15.0757	106.000	1.00000	70/05/26	70/08/15
31673	FECSTREP	MFKFBGAR	/100ML	7	14.4286	120.952	10.9978	.762226	4.15679	35.0000	1.00000	70/07/30	70/08/15
70507	PHOS-T	ORTHO	MG/L P	4	.037000	.000425	.020607	.556958	.010304	.051000	.007000	70/05/07	70/08/01

STORET DATE 73/11/28

571017
** 32 03.0 110 25 00.0 3
YELLOWSTONE LAKE IN BRIDGE BAY
00 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.00

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	15	7.73333	43.7184	6.61199	.831348	1.70721	16.0000	.000000	70/05/07	70/08/10
00020	AIR	TEMP	CENT	15	10.6667	44.7667	6.65332	.612269	1.71788	19.0000	.000000	70/05/07	70/08/10
00070	TU-B	JKSN	JTU	6	1.30000	.992002	.995593	.766149	.406612	3.00000	.500000	70/05/07	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	4	85.7500	29.5833	5.43906	.063429	2.71953	90.0000	76.0000	70/05/07	70/08/03
00300	DO		MG/L	3	6.73333	2.72340	1.65027	.245090	.952796	8.10000	4.90000	70/05/07	70/07/20
00304	BOD	5 DAY	MG/L	4	.725000	.102500	.320157	.441595	.160078	1.00000	.400000	70/05/14	70/06/02
00310	BOD	5 DAY	MG/L	4	1.15000	.083333	.288675	.251021	.144337	1.40000	.900000	70/05/14	70/08/02
00400	PH		SU	3	6.56666	.213432	.461957	.067280	.266728	7.40000	6.60000	70/05/07	70/07/20
00403	LAB	PH	SU	8	7.03749	.064174	.253326	.035743	.089564	7.40000	6.60000	70/05/07	70/08/03
00410	T ALK	CACO3	MG/L	6	30.5000	14.7000	3.83406	.125707	1.56525	38.0000	27.0000	70/05/07	70/08/03
00500	RESIDUE	TOTAL	MG/L	4	101.500	2849.00	53.3760	.525872	26.6880	178.000	54.0000	70/05/07	70/08/03
00515	RESIDUE	DISS-105	C MG/L	4	63.5000	1238.33	35.1900	.554172	17.5950	99.0000	15.0000	70/05/07	70/08/03
00610	NH3-N	TOTAL	MG/L	4	.017500	.000292	.017078	.975900	.008539	.040000	.000000	70/05/07	70/08/03
00625	TOT KJEL	N	MG/L	4	.185000	.010700	.103441	.559139	.051720	.280000	.040000	70/05/07	70/08/03
00630	NO3ENO3	N-TOTAL	MG/L	4	.007500	.000225	.015000	2.00000	.007500	.030000	.000000	70/05/07	70/08/03
00665	PHOS-T	P-WET	MG/L	4	.032500	.000425	.020616	.634324	.010308	.060000	.010000	70/05/07	70/08/03
00680	T ORG C	C	MG/L	4	4.62500	4.84920	2.20209	.476128	1.10104	7.70000	2.80000	70/05/07	70/08/03
00720	CYANIDE	CN	MG/L	1	.000000					.000000	.000000	70/05/25	70/05/25
00915	CALCIUM	CA,DISS	MG/L	4	4.60000	1.25334	1.11953	.243376	.559764	5.60000	3.00000	70/05/07	70/08/03
00925	MGNSIUM	MG,DISS	MG/L	4	2.05000	.170003	.412314	.201129	.206157	2.60000	1.60000	70/05/07	70/08/03
00930	SODIUM	NA,DISS	MG/L	4	8.64999	1.55013	1.24504	.143936	.622521	10.0000	7.10000	70/05/07	70/08/03
00935	PTSSIUM	K,DISS	MG/L	4	2.02500	.029170	.170791	.084341	.085396	2.20000	1.80000	70/05/07	70/08/03
00940	CHLORIDE	CL	MG/L	4	4.50000	1.00000	1.00000	.222222	.500000	6.00000	4.00000	70/05/07	70/08/03
00945	SULFATE	SO4	MG/L	4	12.1250	44.0625	6.63796	.547461	3.31898	22.0000	6.00000	70/05/07	70/08/03
00950	FLUORIDE	F,DISS	MG/L	4	.625000	.069167	.262996	.420794	.131498	1.00000	.400000	70/05/07	70/08/03
00955	SILICA	DISOLVED	MG/L	2	9.50000	.500000	.707107	.074432	.500000	10.0000	9.00000	70/07/20	70/08/03
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/03
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/03
01045	IRON	TOTAL	UG/L	4	87.5000	10625.0	103.078	1.17803	51.5388	200.000	.000000	70/05/07	70/08/03
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/03
01055	MANGNESE	MN	UG/L	4	22.5000	825.000	28.7228	1.27657	14.3614	60.0000	.000000	70/05/07	70/08/03
01090	ZINC	ZN,DISS	UG/L	4	5.00000	100.000	10.0000	2.00000	5.00000	20.0000	.000000	70/05/07	70/08/03
31501	TOT COLI	MFIMENDO	/100ML	16	4.37500	44.1166	6.64204	1.51818	1.66051	26.0000	1.00000	70/05/13	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	22	4.31818	196.799	14.0285	3.24870	2.99088	67.0000	1.00000	70/05/13	70/08/10
31673	FECSTREP	MFKFAGAR	/100ML	6	11.8333	353.767	18.8087	1.58947	7.67861	50.0000	2.00000	70/07/30	70/08/10
32730	PHENOLS		UG/L	4	3.40000	3.95334	1.98830	.584794	.994150	5.00000	.900000	70/05/07	70/08/05
70507	PHOS-T	ORTHO	MG/L P	4	.018250	.000122	.011057	.574373	.005528	.032000	.005000	70/05/07	70/08/03

STORET DATE 72/11/28

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YELLOWSTONE LAKE NEAR OUT ISLAND
60 WYOMING
MISSOURI RIVER
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INDEX 1023300
MILES 1144.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	13	12.1308	1.05534	1.23804	.106179	.357237	13.5000	9.40000	70/07/23	70/08/03
00020	AIR	TEMP	CENT	13	12.0538	1.05772	1.02845	.081276	.285242	15.0000	12.0000	70/07/23	70/08/03
00070	TURB	JKSN	JTU	5	1.23000	3.43799	1.85418	1.43735	.829216	4.60000	.300000	70/06/07	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	3	83.3333	34.3457	5.86052	.062791	3.38357	100.000	89.0000	70/06/07	70/08/03
00300	DO		MG/L	1	7.70000					7.70000	7.70000	70/07/20	70/07/20
00304	BOD	5 DAY	MG/L	2	.400000	.000000	.000000		.000000	.400000	.400000	70/07/31	70/08/02
00310	BOD	5 DAY	MG/L	2	.850000	.045001	.212134	.249570	.150002	1.00000	.700000	70/07/31	70/08/02
00400	PH		SU	2	7.10000	.020020	.141490	.019928	.100049	7.20000	7.00000	70/07/20	70/07/23
00403	LAB	PH	SU	6	7.35000	.037080	.054143	.011402	.037630	7.50000	7.30000	70/06/07	70/08/03
00410	T ALK	CACO3	MG/L	5	29.2000	.701172	.837360	.028677	.374479	30.0000	28.0000	70/06/07	70/08/03
00500	RESIDUE	TOTAL	MG/L	3	82.0000	373.000	19.3132	.235527	11.1505	103.000	65.0000	70/06/07	70/08/03
00515	RESIDUE	DISS-105	C MG/L	3	47.6667	752.336	27.4267	.575428	15.8360	64.0000	16.0000	70/06/07	70/08/03
00610	NH3-N	TOTAL	MG/L	3	.016667	.000233	.015275	.916515	.008819	.030000	.000000	70/06/07	70/08/03
00625	TOT KJEL	N	MG/L	3	.180000	.007500	.086602	.481124	.050000	.280000	.130000	70/06/07	70/08/03
00630	NO23N03	N-TOTAL	MG/L	3	.006667	.000133	.011547	1.73205	.006667	.020000	.000000	70/06/07	70/08/03
00665	PHOS-T	P-WET	MG/L	3	.073333	.007033	.083865	1.14361	.048419	.170000	.020000	70/06/07	70/08/03
00680	T ORG C	C	MG/L	3	4.30000	3.79001	1.94679	.452743	1.12398	6.50000	2.80000	70/06/07	70/08/03
00915	CALCIUM	CA,DISS	MG/L	3	4.76667	.093330	.305500	.064091	.176381	5.10000	4.50000	70/06/07	70/08/03
00925	MAGNSIUM	MG,DISS	MG/L	3	2.03333	.003333	.057749	.028401	.033342	2.10000	2.00000	70/06/07	70/08/03
00930	SODIUM	NA,DISS	MG/L	3	9.10000	.130173	.360795	.039648	.208305	9.50000	8.80000	70/06/07	70/08/03
00935	POTSIUM	K,DISS	MG/L	3	1.83333	.023333	.152752	.083319	.088191	2.00000	1.70000	70/06/07	70/08/03
00940	CHLORIDE	CL	MG/L	3	4.66667	.333333	.577359	.123720	.333333	5.00000	4.00000	70/06/07	70/08/03
00945	SULFATE	SO4	MG/L	3	7.60000	1.81015	1.34542	.177029	.776777	8.70000	6.10000	70/06/07	70/08/03
00950	FLUORIDE	F,DISS	MG/L	3	.533333	.013334	.115472	.216511	.066666	.600000	.400000	70/06/07	70/08/03
00955	SILICA	DISOLVED	MG/L	2	6.00000	5.00000	2.32643	.353553	2.00000	10.0000	6.00000	70/07/20	70/08/03
01005	BARIUM	BA,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01040	COPPER	CU-DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
01045	IRON	TOTAL	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01049	LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01055	MANGANESE	MN	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01093	ZINC	ZN,DISS	UG/L	2	10.0000	300.000	17.3205	1.73205	10.0000	30.0000	.000000	70/06/07	70/08/03
31616	FEC COLI	MFM-FCO	/100ML	5	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/07/30	70/08/03
31673	FECSTREP	MFKFASAB	/100ML	5	1.40000	.300001	.547724	.391231	.244949	2.00000	1.00000	70/07/30	70/08/03
70507	PHOS-T	JETHO	MG/L P	3	.030000	.000300	.017321	.577352	.010000	.050000	.020000	70/06/07	70/08/03

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YELLOWSTONE L. INLET TO N. THUMB
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
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INDEX 1071500
MILES 1143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	20	7.23000	31.6164	5.62285	.772369	1.25731	14.0000	.000000	70/05/11	70/08/10
00020	AIR	TEMP	CENT	20	11.0500	34.7974	5.91536	.535372	1.32233	18.0000	.000000	70/05/11	70/08/10
00070	TURB	JKSN	JTU	7	1.00571	1.52155	1.37170	1.36330	.518453	4.10000	.300000	70/05/11	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	5	79.8000	533.707	23.1021	.289500	10.3316	102.000	44.0000	70/05/11	70/08/03
00299	DO		MG/L	1	10.1000					10.1000	10.1000	70/05/25	70/05/25
00310	BOD	2 DAY	MG/L	4	.875000	.509167	.713559	.815497	.356780	1.90000	.300000	70/05/14	70/08/02
00310	BOD	5 DAY	MG/L	4	1.22500	1.02917	1.01448	.828146	.507239	2.70000	.400000	70/05/14	70/08/02
00400	PH		SU	3	7.06667	.053345	.230965	.032684	.133346	7.20000	6.80000	70/05/25	70/07/23
00403	LAB	PH	SU	9	7.19999	.190063	.435963	.060550	.145321	7.80000	6.60000	70/05/11	70/08/03
00410	T ALK	CACO3	MG/L	7	27.4286	31.9538	5.65277	.206090	2.13654	32.0000	15.0000	70/05/11	70/08/03
00500	RESIDUE	TOTAL	MG/L	5	86.6000	510.307	22.5900	.260854	10.1025	123.000	63.0000	70/05/11	70/08/03
00515	RESIDUE	DISS-105	C MG/L	5	76.3000	434.706	20.8496	.271479	9.32423	107.000	56.0000	70/05/11	70/08/03
00610	NH3-N	TOTAL	MG/L	5	.004000	.000080	.008944	2.23607	.004000	.020000	.000000	70/05/11	70/08/03
00625	TOT KJEL	N	MG/L	5	.120000	.015600	.125897	1.04914	.056303	.340000	.030000	70/05/11	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	5	.006000	.000080	.008944	1.49071	.004000	.020000	.000000	70/05/11	70/08/03
00665	PHOS-T	P-WET	MG/L	5	.062000	.008870	.094161	1.51904	.042119	.230000	.010000	70/05/11	70/08/03
00680	T ORG C	C	MG/L	5	2.32000	.857006	.925746	.399029	.414006	3.80000	1.30000	70/05/11	70/08/03
00916	CALCIUM	CA,DISS	MG/L	4	4.60000	.313334	.559763	.121688	.279881	5.10000	3.80000	70/05/25	70/08/03
00926	MGNSIUM	MG,DISS	MG/L	5	1.86000	.186000	.433589	.233113	.193907	2.20000	1.10000	70/05/11	70/08/03
00930	SODIUM	NA,DISS	MG/L	5	8.35999	6.00311	2.45012	.293077	1.09573	10.0000	4.10000	70/05/11	70/08/03
00935	POTSSIUM	K,DISS	MG/L	5	1.62000	.102002	.319378	.197147	.142830	2.00000	1.20000	70/05/11	70/08/03
00940	CHLORIDE	CL	MG/L	5	4.60000	2.20002	1.48325	.309010	.663329	7.00000	3.00000	70/05/11	70/08/03
00945	SULFATE	SO4	MG/L	5	9.34000	5.67304	2.38286	.255125	1.06565	12.0000	6.70000	70/05/11	70/08/03
00950	FLUORIDE	F,DISS	MG/L	5	.520000	.037000	.192355	.369913	.086024	.700000	.200000	70/05/11	70/08/03
00955	SILICA	DISOLVED	MG/L	2	8.00000	8.00000	2.82843	.353553	2.00000	10.0000	6.00000	70/07/20	70/08/03
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/11	70/08/03
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/11	70/08/03
01045	IRON	TOTAL	UG/L	5	60.0000	18000.0	134.164	2.23607	60.0000	300.000	.000000	70/05/11	70/08/03
01049	LEAD	PB,DISS	UG/L	5	.000000	.000000	.000000		.000000	.000000	.000000	70/05/11	70/08/03
01055	MANGNESE	MN	UG/L	5	.000000	.000000	.000000		.000000	.000000	.000000	70/05/11	70/08/03
01090	ZINC	ZN,DISS	UG/L	5	.000000	.000000	.000000		.000000	.000000	.000000	70/05/11	70/08/03
31501	TOT COLI	MFI4ENDO	/100ML	1	53.0000					53.0000	53.0000	70/05/26	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	11	1.81818	7.36364	2.71360	1.49248	.818182	10.0000	1.00000	70/05/26	70/09/10
31673	FECSTREP	MFKFBGAR	/100ML	10	15.1000	773.655	27.8147	1.84203	8.79577	86.0000	1.00000	70/07/30	70/08/10
70507	PHOS-T	ORTHO	MG/L P	5	.024000	.000284	.016867	.702797	.007543	.050000	.007000	70/05/11	70/08/03

STATIST DATE 70/11/9

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YELLOWSTONE L. IN MARY BAY AREA
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
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INDEX 100100
MILES 1149.60

PARAMETER			NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010 WATE	TEMP	CENT	11	12.8909	16.8409	4.34637	.345179	1.31046	19.0000	5.00000	70/05/07	70/06/15
00020 AIR	TEMP	CENT	11	13.0455	19.0227	4.24082	.321355	1.28349	24.0000	3.00000	70/05/07	70/06/15
00070 TURB	JKSN	JTU	3	1.16667	.033333	.288680	.247440	.166669	1.50000	1.00000	70/05/07	70/07/19
00095 CNDUCTIVY	AT 25C	MICROMHO	3	132.667	1492.33	38.5013	.290211	22.2287	171.000	94.0000	70/05/07	70/07/19
00300 DO		MG/L	3	7.40000	1.12011	1.05835	.135636	.611040	9.00000	7.00000	70/05/07	70/07/19
00304 BOD	2 DAY	MG/L	3	3.43333	10.1233	3.18172	.926714	1.83697	7.10000	1.40000	70/05/14	70/08/10
00310 BOD	5 DAY	MG/L	2	1.60000	.020002	.141430	.088394	.100000	1.70000	1.50000	70/05/14	70/05/16
00400 PH		SU	3	6.26666	.163331	.404217	.064503	.233375	6.70000	5.90000	70/05/07	70/07/19
00403 LAB	PH	SU	6	6.28333	.417764	.646347	.102867	.263870	7.30000	5.40000	70/05/07	70/08/15
00410 T ALK	CACO3	MG/L	3	42.0000	189.000	13.7477	.327327	7.93725	54.0000	27.0000	70/05/07	70/07/19
00520 RESIDUE	TOTAL	MG/L	2	128.000	8.00000	2.82843	.022097	2.00000	130.000	126.000	70/05/07	70/05/24
00515 RESIDUE	DISS-105	C MG/L	2	116.500	34.5000	9.19239	.078905	6.50000	123.000	110.000	70/05/07	70/05/24
00610 NH3-N	TOTAL	MG/L	3	.050000	.002500	.050000	1.00000	.028868	.100000	.000000	70/05/07	70/07/19
00625 TOT KJEL	N	MG/L	3	.316667	.006533	.080829	.255250	.046667	.390000	.230000	70/05/07	70/07/19
00630 NO2&NO3	N-TOTAL	MG/L	3	.023333	.001033	.032140	1.37756	.018559	.060000	.000000	70/05/07	70/07/19
00665 PHOS-T	P-ORT	MG/L	3	.026667	.000233	.015275	.572323	.008819	.040000	.010000	70/05/07	70/07/19
00681 TOC	C	MG/L	3	3.70000	4.27000	2.06640	.558486	1.19303	5.60000	1.50000	70/05/07	70/07/19
00915 CALCIUM	CA,DISS	MG/L	3	5.46666	2.64333	1.62585	.297412	.938686	7.30000	4.20000	70/05/07	70/07/19
00925 MGNSIUM	MG,DISS	MG/L	3	3.23333	.223333	.472584	.146160	.272846	3.60000	2.70000	70/05/07	70/07/19
00930 SODIUM	NA,DISS	MG/L	3	24.5000	27.7500	5.26783	.365296	3.04136	20.0000	9.00000	70/05/07	70/07/19
00935 POTSSIUM	K,DISS	MG/L	3	2.63333	.353333	.602766	.228899	.348007	3.20000	2.00000	70/05/07	70/07/19
00940 CHLORIDE	CL	MG/L	3	7.66667	30.3334	5.50758	.718360	3.17950	14.0000	4.00000	70/05/07	70/07/19
00945 SULFATE	SO4	MG/L	3	20.0000	81.0000	9.00000	.450000	5.19615	29.0000	11.0000	70/05/07	70/07/19
00950 FLORIDE	F,DISS	MG/L	3	.600000	.030001	.173207	.288679	.100001	.800000	.500000	70/05/07	70/07/19
00955 SILICA	DISSLVED	MG/L	1	10.0000					10.0000	10.0000	70/07/19	70/07/19
01005 BARIUM	BA,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/07/19
01040 COPPER	CU-DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/07/19
01045 IRON	TOTAL	UG/L	3	223.333	12133.4	110.152	.493216	63.5960	350.000	150.000	70/05/07	70/07/19
01051 LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/07/19
01055 MANGNESE	MN	UG/L	3	30.0000	1300.00	36.0555	1.20185	20.8166	70.0000	.000000	70/05/07	70/07/19
01090 ZINC	ZN,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/07/19
31501 TOT COLI	MFI-MENGO	/100ML	1	20.0000					20.0000	20.0000	70/05/26	70/05/26
31616 FEC COLI	MFI-FCBR	/100ML	3	4.33333	24.3333	4.93289	1.13836	2.84800	10.0000	1.00000	70/05/26	70/08/10
31673 FECSTREP	MFKFBGAR	/100ML	2	2.50000	4.50000	2.12132	.848528	1.50000	4.00000	1.00000	70/08/10	70/08/10
70507 PHOS-T	D-THO	MG/L P	3	.042667	.004346	.069616	1.40166	.040193	.130000	.007000	70/05/07	70/07/19

STREET [illegible] 72/12/26

STAGE 1
[illegible]
YELLOWSTONE R. IN FLAT MT. A-M
60 [illegible] MING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MER 77777777
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INDEX 1067500
MILES 1149.60

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STANDARD ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	15	11.0333	1.10071	1.04915	.090204	.270991	13.5000	9.40000	70/07/23	70/08/03
00020	AIR	TEMP	CENT	13	11.2692	3.56734	1.88974	.167602	.523942	15.5000	10.0000	70/07/23	70/08/03
00070	TURB	JKSN	JTU	5	.438000	.003220	.056747	.129559	.025376	.500000	.390000	70/06/07	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	3	95.6667	6.34765	2.51945	.026336	1.45461	98.0000	93.0000	70/06/07	70/08/03
00300	DO		MG/L	1	8.40000					8.40000	8.40000	70/07/20	70/07/20
00304	BOD	5 DAY	MG/L	2	.200000	.020000	.141421	.471405	.100000	.400000	.200000	70/07/31	70/08/02
00310	BOD	5 DAY	MG/L	2	.600000	.000000	.000423	.000705	.000299	.600000	.600000	70/07/31	70/08/02
00400	PH		SU	2	7.05000	.045013	.212164	.030094	.150022	7.20000	6.90000	70/07/20	70/07/23
00403	LAB	PH	SU	5	7.29999	.039139	.253089	.038779	.126601	7.60000	7.00000	70/06/07	70/08/03
00410	T ALK	CACO3	MG/L	5	29.4000	.300761	.548435	.018654	.245268	30.0000	29.0000	70/06/07	70/08/03
00500	RESIDUE	TOTAL	MG/L	3	95.6667	2564.35	50.6394	.529332	29.2366	154.000	63.0000	70/06/07	70/08/03
00515	RESIDUE	DISS-105	L MG/L	3	65.3333	58.3359	7.63780	.116905	4.40965	72.0000	57.0000	70/06/07	70/08/03
00610	NH3-N	TOTAL	MG/L	3	.010000	.000000	.000000		.000000	.010000	.010000	70/06/07	70/08/03
00625	TOT KJEL	N	MG/L	3	.110000	.005200	.072111	.655555	.041633	.170000	.030000	70/06/07	70/08/03
00630	N02&N03	N-TOTAL	MG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
00665	PHOS-T	P-WET	MG/L	3	.080000	.007500	.086603	1.08253	.050000	.180000	.030000	70/06/07	70/08/03
00680	T ORG C	C	MG/L	3	2.23333	.763333	.873689	.391204	.504425	3.20000	1.50000	70/06/07	70/08/03
00915	CALCIUM	CA,DISS	MG/L	3	4.76667	.093330	.305500	.064091	.176381	5.10000	4.50000	70/06/07	70/08/03
00925	MGNSIUM	MG,DISS	MG/L	3	2.06667	.013333	.115470	.055875	.066667	2.20000	2.00000	70/06/07	70/08/03
00930	SODIUM	NA,DISS	MG/L	3	9.56667	.163330	.404141	.042245	.233331	10.0000	9.20000	70/06/07	70/08/03
00935	POTSSIUM	K,DISS	MG/L	3	1.83333	.023333	.152752	.083319	.088191	2.00000	1.70000	70/06/07	70/08/03
00940	CHLORIDE	CL	MG/L	3	5.00000	.000000	.000000		.000000	5.00000	5.00000	70/06/07	70/08/03
00945	SULFATE	SO4	MG/L	3	8.33333	2.41344	1.55352	.186423	.896927	9.60000	6.60000	70/06/07	70/08/03
00950	FLUORIDE	F,DISS	MG/L	3	.566667	.003333	.057736	.101887	.033334	.600000	.500000	70/06/07	70/08/03
00955	SILICA	DISSLVED	MG/L	2	7.50000	4.50000	2.12132	.282843	1.50000	9.00000	6.00000	70/07/20	70/08/03
01005	BARIUM	BA,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01040	COPPER	CU-DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
01045	IRON	TOTAL	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01049	LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01055	MANGNESE	MN	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01090	ZINC	ZN,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
31616	FEC COLI	MFM-FCBR	/100ML	5	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/07/30	70/08/03
31673	FECSTREP	MFKFASAR	/100ML	5	1.60000	1.80000	1.34164	.838526	.600000	4.00000	1.00000	70/07/30	70/08/03
70507	PHOS-T	ORTHO	MG/L P	3	.030000	.000700	.026457	.881917	.015275	.060000	.010000	70/06/07	70/08/03

STORET DATE 70/11/23

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YELLOWSTONE L. AT SOUTH ARM
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021000
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	13	11.3077	9.10417	3.01731	.266937	.836951	15.5000	5.70000	70/07/23	70/08/03
00020	AIR	TEMP	CENT	12	10.2750	3.49361	1.86912	.176717	.519401	15.0000	9.50000	70/07/23	70/08/03
00070	TURB	JKSN	JTU	5	.364000	.002480	.049802	.136820	.022272	.450000	.300000	70/06/07	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	3	95.3333	17.3467	4.16462	.043667	2.40456	100.000	92.0000	70/06/07	70/08/03
00300	BOD	5 DAY	MG/L	2	.400000	.080000	.282843	.707107	.200000	.600000	.200000	70/07/31	70/08/02
00400	PH		SU	2	.750000	.245000	.494975	.659967	.350000	1.10000	.400000	70/07/31	70/08/02
00403	LAB	PH	SU	2	7.05000	.045013	.212164	.030094	.150022	7.20000	6.90000	70/07/30	70/07/23
00410	T ALK	CACO3	MG/L	5	7.38000	.017080	.130728	.017714	.055463	7.50000	7.20000	70/06/07	70/08/03
00500	RESIDUE	TOTAL	MG/L	3	30.0000	.500000	.707107	.023570	.316226	31.0000	29.0000	70/06/07	70/08/03
00515	RESIDUE	DISS-105	C MG/L	3	90.6667	1046.35	32.3473	.356772	18.6757	127.000	65.0000	70/06/07	70/08/03
00610	NH3-N	TOTAL	MG/L	3	67.0000	91.0000	9.53939	.142379	5.50757	78.0000	61.0000	70/06/07	70/08/03
00625	TOT KJEL	N	MG/L	3	.023333	.000233	.015275	.654655	.008819	.040000	.010000	70/06/07	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	3	.143333	.012033	.109696	.765324	.063333	.230000	.020000	70/06/07	70/08/03
00665	PHOS-T	P-WET	MG/L	3	.006667	.000133	.011547	1.73205	.006667	.020000	.000000	70/06/07	70/08/03
00680	T ORG C	C	MG/L	3	.086667	.009633	.098150	1.13249	.056667	.200000	.030000	70/06/07	70/08/03
00915	CALCIUM	CA,DISS	MG/L	3	4.10000	.269667	.519612	.126735	.299998	4.70000	3.80000	70/06/07	70/08/03
00925	MGNSIUM	MG,DISS	MG/L	3	2.16667	.043333	.208171	.096079	.120187	5.10000	4.50000	70/06/07	70/08/03
00930	SODIUM	NA,DISS	MG/L	3	2.00000	.130127	.360731	.037576	.208268	10.0000	9.30000	70/06/07	70/08/03
00935	POTSSIUM	K,DISS	MG/L	3	1.83333	.023333	.152752	.083319	.088191	2.00000	1.70000	70/06/07	70/08/03
00940	CHLORIDE	CL	MG/L	3	5.00000	.000000	.000000		.000000	5.00000	5.00000	70/06/07	70/08/03
00945	SULFATE	SO4	MG/L	3	7.33333	3.06344	1.75027	.223439	1.01052	9.60000	6.10000	70/06/07	70/08/03
00950	FLUORIDE	F,DISS	MG/L	3	.600000	.000000	.000691	.001151	.000399	.600000	.600000	70/06/07	70/08/03
00955	SILICA	DISOLVED	MG/L	1	9.00000					9.00000	9.00000	70/08/03	70/08/03
01005	BARIUM	BA,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01040	COPPER	CU-DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
01045	IRON	TOTAL	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01049	LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01055	MANGNESE	MN	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01090	ZINC	ZN,DISS	UG/L	5	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
31616	FEC COLI	MEM-FCHB	/100ML	5	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/07/30	70/08/03
31673	FECSTREP	MEKFASAB	/100ML	5	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/07/30	70/08/03
70507	PHOS-T	ORTHO	MG/L P	3	.023333	.000033	.005774	.247438	.003333	.030000	.020000	70/06/07	70/08/03

STATE DATE 78/11/14

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571021
44 27 00.0 110 15 00.0 3
YELLOWSTONE LAKE AT S. EAST ARM
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1071000
MILES 1142.43

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	14	11.7357	5.03716	2.25547	.192159	.602801	13.5000	6.40000	70/07/23	70/08/03
00020	AIR	TEMP	CENT	14	11.0000	3.53346	1.88108	.171007	.502740	14.0000	5.00000	70/07/23	70/08/03
00070	TURB	JKSN	JTU	5	1.04000	.003002	.450557	.433228	.201495	1.70000	.500000	70/06/07	70/06/03
00095	CNDUCTVY	AT 25C	MICROMHO	3	81.3333	186.336	13.6505	.167834	7.88111	97.0000	72.0000	70/06/07	70/08/03
00300	DO		MG/L	1	8.10000					8.10000	8.10000	70/07/20	70/07/20
00304	BOD	2 DAY	MG/L	2	.400000	.000000	.000000		.000000	.400000	.400000	70/07/31	70/08/02
00310	BOD	5 DAY	MG/L	2	.850000	.005001	.070718	.083195	.050005	.900000	.800000	70/07/31	70/08/02
00400	PH		SU	2	7.10000	.020020	.141490	.019928	.100040	7.20000	7.00000	70/07/20	70/07/23
00403	LAB	PH	SU	5	7.24000	.053130	.233322	.039824	.123942	7.60000	6.90000	70/06/07	70/08/03
00410	T ALK	CACO3	MG/L	5	27.0000	2.00000	1.41421	.052378	.632455	29.0000	25.0000	70/06/07	70/08/03
00500	RESIDUE	TOTAL	MG/L	2	72.5000	60.5000	7.77817	.107285	5.50000	78.0000	67.0000	70/06/07	70/08/03
00515	RESIDUE	DISS-105	C MG/L	2	62.0000	2.00000	1.41421	.022810	1.00000	63.0000	61.0000	70/06/07	70/08/03
00610	NH3-N	TOTAL	MG/L	3	.016667	.000133	.011547	.692820	.006667	.030000	.010000	70/06/07	70/08/03
00625	TOT KJEL	N	MG/L	3	.096667	.015633	.125033	1.29345	.072188	.240000	.010000	70/06/07	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	3	.010000	.000300	.017321	1.73205	.010000	.030000	.000000	70/06/07	70/08/03
00665	PHOS-T	P-WET	MG/L	3	.103333	.014033	.118462	1.14641	.068394	.240000	.030000	70/06/07	70/08/03
00680	T ORG C	C	MG/L	3	5.56667	6.60334	2.56970	.461622	1.48361	8.30000	3.20000	70/06/07	70/08/03
00915	CALCIUM	CA,DISS	MG/L	3	4.53333	.023338	.152769	.033699	.088201	4.70000	4.40000	70/06/07	70/08/03
00925	MGNSIUM	MG,DISS	MG/L	3	1.83333	.053332	.230936	.125966	.133332	2.10000	1.70000	70/06/07	70/08/03
00930	SODIUM	NA,DISS	MG/L	3	7.60000	1.48015	1.21661	.160081	.702412	9.00000	6.80000	70/06/07	70/08/03
00935	POTSSIUM	K,DISS	MG/L	3	2.23333	1.21333	1.10151	.493215	.635959	3.50000	1.50000	70/06/07	70/08/03
00940	CHLORIDE	CL	MG/L	3	3.33333	2.33334	1.52753	.456259	.881919	5.00000	2.00000	70/06/07	70/08/03
00945	SULFATE	SO4	MG/L	3	7.63333	2.77337	1.66534	.218167	.961486	9.50000	6.30000	70/06/07	70/08/03
00950	FLUORIDE	F,DISS	MG/L	2	.450000	.005000	.070711	.157135	.050000	.500000	.400000	70/07/20	70/08/03
00955	SILICA	DISOLVED	MG/L	2	11.5000	.500000	.707107	.061488	.500000	12.0000	11.0000	70/07/20	70/08/03
01005	BARIUM	BA,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
01040	COPPER	CU-DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
01045	IRON	TOTAL	UG/L	3	73.3333	4133.33	64.2910	.876696	37.1184	120.000	.000000	70/06/07	70/08/03
01049	LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01055	MANGNESE	MN	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
01092	ZINC	ZN,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/07	70/08/03
31616	FEC COLI	MFM-FCBR	/100ML	9	1.11111	.111112	.333335	.300002	.111112	2.00000	1.00000	70/07/30	70/08/03
31673	FECSTREP	MFKFBAGAR	/100ML	9	2.33333	4.50001	2.12132	.909138	.707107	6.00000	1.00000	70/07/30	70/08/03
70507	PHOS-T	ORTHO	MG/L P	3	.033333	.000233	.015275	.458259	.008819	.050000	.020000	70/06/07	70/08/03

STA [illegible] DATE 72/11/24

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571024
** 10 20.0 110 12 15.0 3
YELLOWSTONE L WHERE RIVER ENTERS
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MAR 77777777
0000

INDEX 1021500
MILES 1147.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	5	11.7000	3.75007	1.71755	.146802	.765124	13.0000	9.00000	70/07/23	70/08/03
00020	AIR	TEMP	CENT	6	10.4167	7.24175	2.69105	.258341	1.09862	15.0000	7.00000	70/07/20	70/08/03
00070	TURB	JKSN	JTU	4	4.12500	35.1559	5.92924	1.43739	2.96462	13.0000	.800000	70/07/20	70/08/03
00095	CONDUCTVY	AT 25C	MICROMHO	2	47.5000	220.500	14.8492	.312616	10.5000	58.0000	37.0000	70/07/20	70/08/03
00300	DO		MG/L	1	7.10000					7.10000	7.10000	70/07/20	70/07/20
00310	BOD	5 DAY	MG/L	2	.450000	.005000	.070711	.157135	.050000	.500000	.400000	70/07/31	70/08/02
00340	COD	5 DAY	MG/L	2	.550000	.005001	.070716	.083196	.050005	.600000	.500000	70/07/31	70/08/02
00400	PH		SU	2	7.05000	.045013	.212164	.030094	.150022	7.20000	6.90000	70/07/23	70/07/23
00425	LAB	PH	SU	4	7.22500	.015954	.126312	.017427	.062956	7.40000	7.10000	70/07/20	70/08/03
00410	T ALK	CACO3	MG/L	4	23.7500	.250000	.500000	.021052	.250000	24.0000	23.0000	70/07/20	70/08/03
00500	RESIDUE	TOTAL	MG/L	2	88.5000	364.500	19.0919	.213317	13.5000	103.000	76.0000	70/07/20	70/08/03
00515	RESIDUE	DISS-105	C MG/L	2	79.5000	1012.50	31.8198	.400249	22.5000	102.000	57.0000	70/07/20	70/08/03
00610	NH3-N	TOTAL	MG/L	2	.005000	.000050	.007071	1.41421	.005000	.010000	.000000	70/07/20	70/08/03
00625	TOT KJEL	N	MG/L	2	.150000	.000800	.028284	.188561	.020000	.170000	.130000	70/07/20	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
00665	PHOS-T	P-WET	MG/L	2	.075000	.000050	.007071	.094282	.005000	.080000	.070000	70/07/20	70/08/03
00680	TOC	C	MG/L	2	2.20000	.080000	.282843	.128565	.200000	2.40000	2.00000	70/07/20	70/08/03
00915	CALCIUM	CA,DISS	MG/L	2	4.25000	.044938	.212128	.049912	.149997	4.40000	4.10000	70/07/20	70/08/03
00925	MAGNESIUM	MG,DISS	MG/L	2	1.85000	.004998	.070705	.038219	.049996	1.90000	1.80000	70/07/20	70/08/03
00930	SODIUM	NA,DISS	MG/L	2	3.50000	2.00000	1.41421	.404061	1.00000	4.50000	2.50000	70/07/20	70/08/03
00935	POTASSIUM	K,DISS	MG/L	2	1.30000	.000000	.000000		.000000	1.30000	1.30000	70/07/20	70/08/03
00940	CHLORIDE	CL	MG/L	2	.600000	.320000	.565686	.942809	.400000	1.00000	.200000	70/07/20	70/08/03
00945	SULFATE	SO4	MG/L	2	5.50000	5.78001	2.40417	.437121	1.70000	7.20000	3.80000	70/07/20	70/08/03
00950	FLUORIDE	F,DISS	MG/L	2	.150000	.005000	.070711	.471404	.050000	.200000	.100000	70/07/20	70/08/03
00955	SILICA	DISSOLVED	MG/L	2	15.0000	18.0000	4.24264	.235702	3.00000	21.0000	15.0000	70/07/20	70/08/03
01000	ARSENIC	AS,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
01042	COPPER	CU-DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
01045	IRON	TOTAL	UG/L	2	200.000	12800.0	113.137	.565685	80.0000	280.000	120.000	70/07/20	70/08/03
01049	LEAD	PB,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
01055	MANGANESE	MN	UG/L	2	15.0000	450.000	21.2132	1.41421	15.0000	30.0000	.000000	70/07/20	70/08/03
01059	ZINC	ZN,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/20	70/08/03
31616	FEC COLI	MFCFBGAR	/100ML	4	13.7500	44.2500	6.65207	.483787	3.32603	20.0000	8.00000	70/07/31	70/08/03
31673	FECOLI-P	MFCFBGAR	/100ML	4	13.7500	634.250	25.1843	1.34316	12.5922	56.0000	2.00000	70/07/31	70/08/03
70507	PHOS-T	OPTHO	MG/L P	2	.035000	.000050	.007071	.202031	.005000	.040000	.030000	70/07/20	70/08/03

STORET [illegible] 72/11/23

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INDEX 1077500
MILES 1142.0

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	17	5.94706	34.0114	5.83193	.980642	1.41445	14.0000	.000000	70/05/08	70/08/10
00020 AIR		TEMP	CENT	17	10.9706	43.2022	6.57284	.599133	1.59415	18.0000	.000000	70/05/08	70/08/10
00070 TURB		JKSN	JTU	6	.566666	.098667	.314113	.554317	.128236	1.10000	.300000	70/05/08	70/06/03
00095 CNDUCTVY		AT 25C	MICROMHO	4	68.7500	1322.25	36.3628	.528913	18.1814	98.0000	20.0000	70/05/08	70/08/03
00300 DO			MG/L	3	7.59999	1.83015	1.35283	.169104	.781059	9.30000	6.60000	70/05/08	70/07/20
00310 BOD		5 DAY	MG/L	4	1.000000	.566666	.752772	.752773	.376386	1.70000	.300000	70/05/14	70/08/02
00340 COD		5 DAY	MG/L	3	1.13333	.573337	.757190	.668109	.437164	2.00000	.600000	70/05/16	70/08/02
00400 PH			SU	4	7.20000	.046722	.216154	.030021	.108077	7.50000	7.00000	70/05/08	70/07/23
00403 LAB		PH	SU	6	7.13749	.402727	.634605	.088912	.224368	8.20000	6.00000	70/05/06	70/08/03
00410 T ALK		CACO3	MG/L	6	28.3666	116.248	10.7318	.380098	4.40166	41.0000	3.20000	70/05/08	70/08/03
00500 RESIDUE		TOTAL	MG/L	3	72.3333	1925.34	43.8786	.606617	25.3333	107.000	23.0000	70/05/25	70/08/03
00515 RESIDUE		DISS-105	C MG/L	4	67.0000	1167.33	34.1663	.509944	17.0831	98.0000	21.0000	70/05/08	70/08/03
00625 NH3-N		TOTAL	MG/L	4	.020000	.000467	.021602	1.08012	.010801	.050000	.000000	70/05/06	70/08/03
00625 TOT KJEL		N	MG/L	4	.135000	.007233	.085049	.629994	.042525	.250000	.050000	70/05/08	70/08/03
00630 NO2&NO3		N-TOTAL	MG/L	4	.025000	.001900	.043589	1.74356	.021794	.090000	.000000	70/05/08	70/08/03
00665 PHOS-T		P-WET	MG/L	4	.037500	.000758	.027538	.734343	.013769	.070000	.010000	70/05/08	70/08/03
00681 T ORG C		C	MG/L	3	2.40000	2.56000	1.60000	.666667	.923761	4.00000	.600000	70/05/25	70/08/03
00915 CALCIUM		CA,DISS	MG/L	4	3.60000	3.72666	1.93045	.536236	.965228	5.10000	.800000	70/05/08	70/08/03
00925 MAGNESIUM		MG,DISS	MG/L	4	2.67500	1.31583	1.14710	.428621	.573548	4.30000	1.60000	70/05/08	70/08/03
00930 SODIUM		NA,DISS	MG/L	4	7.20000	17.3133	4.23242	.587836	2.11621	11.0000	1.70000	70/05/08	70/08/03
00935 POTASSIUM		K,DISS	MG/L	4	1.35000	.470001	.685566	.507827	.342783	2.00000	.500000	70/05/08	70/08/03
00940 CHLORIDE		CL	MG/L	4	5.00000	10.6667	3.26599	.653197	1.63299	9.00000	1.00000	70/05/08	70/08/03
00945 SULFATE		SO4	MG/L	4	6.92500	6.02251	2.45408	.354380	1.22704	9.20000	3.50000	70/05/08	70/08/03
00950 FLUORIDE		F,DISS	MG/L	4	.450000	.070000	.264575	.587945	.132288	.700000	.100000	70/05/08	70/08/03
00955 SILICA		DISSOLVED	MG/L	2	9.50000	.500000	.707107	.074432	.500000	10.0000	9.00000	70/07/20	70/08/03
01000 ARSENIC		AS,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01040 COPPER		CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01045 IRON		TOTAL	UG/L	4	25.0000	2500.00	50.0000	2.00000	25.0000	100.000	.000000	70/05/08	70/08/03
01049 LEAD		PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01055 MANGANESE		MN	UG/L	4	35.0000	566.666	23.8048	.680136	11.9024	50.0000	.000000	70/05/08	70/08/03
01090 ZINC		ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
31501 TOT COLI		MFIMENDO	/100ML	6	9.66667	450.967	21.2299	2.19609	8.66667	53.0000	1.00000	70/05/13	70/05/26
31616 FEC COLI		MFM-FCBR	/100ML	14	3.76571	108.643	10.4232	2.75329	2.76571	40.0000	1.00000	70/05/13	70/08/10
31673 FECSTREP		MFKENGAR	/100ML	6	4.00000	43.7143	6.61165	1.65292	2.33758	20.0000	1.00000	70/07/30	70/08/10
70507 PHOS-T		ORTHO	MG/L P	4	.023500	.000369	.019209	.817422	.009605	.050000	.004000	70/05/08	70/08/03

STORET DATE 72/11/2

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INDEX 1071500
MILES 1149.4

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	11	9.62727	12.3352	3.51256	.357432	1.05908	15.0000	5.50000	70/05/08	70/08/10
00020	AIR	TEMP	CENT	11	14.0909	23.0909	4.80530	.341022	1.44885	17.0000	.000000	70/05/08	70/08/10
00070	TU-B	JKSN	JTU	6	.683333	.425667	.652432	.954778	.266354	2.00000	.300000	70/05/08	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	4	110.000	1194.00	34.5543	.314130	17.2771	161.000	85.0000	70/05/08	70/08/03
00300	DO		MG/L	3	8.83333	.823456	.907445	.102730	.523913	9.80000	8.00000	70/05/08	70/08/03
00301	BOD	5 DAY	MG/L	2	.400000	.080000	.282843	.707107	.200000	.600000	.200000	70/07/20	70/07/20
00310	BOD	5 DAY	MG/L	2	.700000	.020000	.141423	.202032	.100001	.800000	.600000	70/07/31	70/08/02
00400	PH		SU	3	6.83333	.103424	.321596	.047063	.185674	7.20000	6.60000	70/07/31	70/08/02
00403	LAB	PH	SU	6	7.33333	.301660	.549236	.074389	.224225	8.30000	6.60000	70/05/08	70/08/20
00410	T ALK	CACO3	MG/L	6	36.6667	337.068	18.9266	.515342	8.13498	79.0000	27.0000	70/05/08	70/08/03
00500	RESIDUE	TOTAL	MG/L	4	96.0000	81.3333	9.01850	.093943	4.50925	103.000	83.0000	70/05/08	70/08/03
00515	RESIDUE	DISS-105	C MG/L	4	69.7500	753.250	27.5363	.394786	13.7682	101.000	35.0000	70/05/08	70/08/03
00610	AMR-N	TOTAL	MG/L	4	.037500	.001825	.042720	1.13920	.021360	.100000	.010000	70/05/06	70/08/03
00625	TOT KJEL	N	MG/L	4	.117500	.002156	.046454	.395387	.023229	.160000	.060000	70/05/08	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	4	.010000	.000200	.014142	1.41421	.007071	.030000	.000000	70/05/08	70/08/03
00665	PHOS-T	P-WET	MG/L	4	.050000	.001333	.036515	.730296	.018257	.090000	.010000	70/05/08	70/08/03
00680	T ORG C	C	MG/L	4	3.95000	2.03000	1.42473	.360704	.712390	5.70000	2.40000	70/05/08	70/08/03
00915	CALCIUM	CA,DISS	MG/L	4	4.32500	1.36919	1.17012	.270549	.585062	5.10000	2.60000	70/05/08	70/08/03
00925	MAGNESIUM	MG,DISS	MG/L	4	2.27500	.115335	.340345	.149602	.170172	2.60000	1.80000	70/05/08	70/08/03
00930	SODIUM	NA,DISS	MG/L	4	8.22499	15.4426	3.92971	.477777	1.96485	11.0000	2.40000	70/05/08	70/08/03
00935	POTASSIUM	K,DISS	MG/L	4	1.37500	.062501	.250001	.126585	.125001	2.30000	1.70000	70/05/08	70/08/03
00940	CHLORIDE	CL	MG/L	4	8.00000	28.6667	5.35412	.669266	2.67706	16.0000	5.00000	70/05/08	70/08/03
00945	SULFATE	SO4	MG/L	4	9.05000	8.67668	2.94562	.325483	1.47281	12.0000	5.00000	70/05/06	70/08/03
00950	FLUORIDE	F,DISS	MG/L	4	.875000	.235833	.485627	.555002	.242813	1.60000	.600000	70/05/06	70/08/03
00955	SILICA	DISSLVED	MG/L	2	5.50000	24.5000	4.94975	.899954	3.50000	9.00000	2.00000	70/07/20	70/08/03
01000	ARSENIC	AS,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/06	70/08/03
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01045	IRON	TOTAL	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01055	MANGNESE	MN	UG/L	4	10.0000	133.333	11.5470	1.15470	5.77350	20.0000	.000000	70/05/08	70/08/03
01090	ZINC	ZN,DISS	UG/L	4	.037500	.005625	.075000	2.00000	.037500	.150000	.000000	70/05/08	70/08/03
31501	TOT COLI	MFIMENDO	/100ML	1	1.00000					1.00000	1.00000	70/05/26	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	9	4.55556	113.778	10.6667	2.34146	3.55556	33.0000	1.00000	70/05/26	70/08/10
31673	FECSTREP	MFKFBGAR	/100ML	8	49.2500	6841.07	82.7108	1.67941	29.2427	210.000	1.00000	70/07/30	70/08/10
71507	PHOS-T	DETHO	MG/L P	4	.014500	.000084	.009147	.630824	.004573	.024000	.004000	70/05/08	70/08/03

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MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	14	9.00000	63.5077	8.15465	1.01718	2.44668	20.0000	.000000	70/05/11	70/08/03
00020	AIR	TEMP	CENT	14	12.0357	38.7571	6.22793	.517454	1.66448	23.0000	.000000	70/05/11	70/08/03
00070	TURB	JASN	JTU	6	1.11667	1.38667	1.17884	1.05568	.481260	3.00000	.300000	70/05/11	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	4	20.0000	6.66667	2.58199	.129099	1.29099	23.0000	17.0000	70/05/11	70/08/03
00300	DO		MG/L	3	7.53333	.573456	.757269	.100522	.437209	8.40000	7.00000	70/05/25	70/08/03
00310	BOD	5 DAY	MG/L	5	.640000	.263000	.512835	.610518	.229347	1.60000	.400000	70/05/20	70/07/28
00400	PH		SU	5	1.26000	.323000	.568332	.451057	.254166	2.20000	.700000	70/05/20	70/07/28
00403	LAB	PH	SU	4	7.30000	.436740	.697668	.095571	.348834	8.20000	6.70000	70/05/21	70/08/03
00410	T ALK	CACO3	MG/L	6	6.46888	.173645	.416707	.064219	.138602	7.30000	5.90000	70/05/11	70/08/03
00500	RESIDUE	TOTAL	MG/L	6	6.90000	22.2201	4.71382	.529642	1.92441	18.0000	4.40000	70/05/11	70/08/03
00515	RESIDUE	DISS-105	C MG/L	4	66.0000	38.0000	6.16441	.093400	3.08221	74.0000	59.0000	70/05/11	70/08/03
00610	NH3-N	TOTAL	MG/L	4	23.7500	448.250	21.1719	.711661	10.5860	52.0000	1.00000	70/05/11	70/08/03
00625	TOT KJEL	N	MG/L	4	.012500	.000225	.015000	1.20000	.007500	.030000	.000000	70/05/11	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	4	.192500	.015225	.123390	.640985	.061695	.280000	.010000	70/05/11	70/08/03
00665	PHOS-T	P-WET	MG/L	4	.007500	.000225	.015000	2.00000	.007500	.030000	.000000	70/05/11	70/08/03
00671	T ORG C	C	MG/L	4	.040000	.001800	.042426	1.06066	.021213	.100000	.010000	70/05/11	70/08/03
00915	CALCIUM	CA,DISS	MG/L	4	2.40000	.739995	.860230	.358429	.430115	3.40000	1.50000	70/05/11	70/08/03
00925	MAGNSIUM	MG,DISS	MG/L	4	1.50000	.286663	.535414	.356943	.267707	2.10000	.800000	70/05/11	70/08/03
00930	SODIUM	NA,DISS	MG/L	4	.500000	.013333	.115470	.230940	.057735	.600000	.400000	70/05/11	70/08/03
00935	POTSSIUM	K,DISS	MG/L	4	1.000000	.006666	.081649	.081649	.040824	1.10000	.900000	70/05/11	70/08/03
00940	CHLORIDE	CL	MG/L	4	1.000000	.026667	.163299	.163299	.081650	1.20000	.800000	70/05/11	70/08/03
00945	SULFATE	SO4	MG/L	4	1.57500	2.62917	1.62147	1.02951	.810735	4.00000	.600000	70/05/11	70/08/03
00950	FLUORIDE	F,DISS	MG/L	4	5.67500	9.11690	3.01925	.532028	1.50963	10.0000	3.60000	70/05/11	70/08/03
00955	SILICA	DISOLVED	MG/L	4	.050000	.003333	.057735	1.15470	.028867	.100000	.000000	70/05/11	70/08/03
01005	BARIUM	BA,DISS	UG/L	2	1.50000	.500000	.707107	.471404	.500000	2.00000	1.00000	70/07/21	70/08/03
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/11	70/08/03
01045	IRON	TOTAL	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/11	70/08/03
01049	LEAD	PB,DISS	UG/L	4	62.5000	15625.0	125.000	2.00000	62.5000	250.000	.000000	70/05/11	70/08/03
01055	MANGNESE	MN	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/11	70/08/03
01090	ZINC	ZN,DISS	UG/L	4	7.50000	225.000	15.0000	2.00000	7.50000	30.0000	.000000	70/05/11	70/08/03
31501	TOT COLI	MFIMENDL	/100ML	5	.000000	.000000	.000000		.000000	.000000	.000000	70/05/11	70/08/03
31616	FEC COLI	MFM-FCBR	/100ML	10	2.60000	12.3000	3.57771	1.37604	1.00000	9.00000	1.00000	70/05/18	70/05/22
31673	FECSTREP	MFKFAGAR	/100ML	5	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/05/18	70/07/29
70507	PHOS-T	ORTHO	MG/L P	4	6.20000	100.700	10.0349	1.61854	4.48776	24.0000	1.00000	70/07/25	70/07/29
				4	.011750	.000131	.011442	.973777	.005721	.023000	.000000	70/05/11	70/08/03

STORET DATE 72/11/29

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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	16	14.4333	16.4595	4.05704	.281088	1.04752	20.0000	9.00000	70/05/08	70/06/19
00020	AIR	TEMP	CENT	16	12.2500	41.1333	6.41353	.523553	1.60338	24.0000	4.00000	70/05/08	70/08/19
00070	TURB	JKSN	JTU	4	1.82500	2.02917	1.42449	.780542	.712244	3.90000	.800000	70/05/08	70/07/30
00095	CNDUCTVY	AT 25C	MICROMHO	4	356.250	7432.25	86.2105	.241994	43.1052	428.000	236.000	70/05/06	70/07/30
00300	OD		MG/L	4	8.12500	.762614	.873278	.107480	.436639	9.30000	7.20000	70/05/08	70/07/30
00334	BOD	2 DAY	MG/L	3	.900000	.070000	.264575	.293973	.152753	1.10000	.600000	70/05/20	70/08/12
00310	BOD	5 DAY	MG/L	3	1.43333	.263336	.513163	.358021	.296275	2.00000	1.00000	70/05/20	70/08/12
00400	PH		SU	4	7.09999	.020091	.141742	.019964	.070871	7.20000	6.90000	70/05/06	70/07/30
00403	LAB	PH	SU	3	7.42222	.259491	.509403	.068632	.169801	8.70000	7.00000	70/05/08	70/08/17
00410	T ALK	CACO3	MG/L	5	99.4000	612.808	24.7550	.249044	11.0708	124.000	58.0000	70/05/08	70/08/17
00500	RESIDUE	TOTAL	MG/L	4	310.500	3113.67	55.8002	.179711	27.9001	372.000	237.000	70/05/06	70/07/30
00515	RESIDUE	DISS-105	C MG/L	4	261.000	4866.00	69.7567	.267267	34.8784	329.000	167.000	70/05/08	70/07/30
00610	NH3-N	TOTAL	MG/L	4	.010000	.000133	.011547	1.15470	.005773	.020000	.000000	70/05/08	70/07/30
00625	TOT KJEL	N	MG/L	4	.162500	.009225	.096047	.629815	.048023	.250000	.020000	70/05/08	70/07/30
00630	NO2&NO3	N-TOTAL	MG/L	4	.017500	.000092	.009574	.547101	.004787	.030000	.010000	70/05/08	70/07/30
00665	PHOS-T	P-WET	MG/L	4	.120000	.006733	.082057	.683807	.041028	.220000	.020000	70/05/08	70/07/30
00680	T ORG C	C	MG/L	4	5.27500	13.8492	3.72145	.705489	1.86073	10.0000	2.20000	70/05/08	70/07/30
00915	CALCIUM	CA,DISS	MG/L	4	5.80000	.140055	.374240	.064524	.187120	6.30000	5.40000	70/05/08	70/07/30
00925	MGNSIUM	MG,DISS	MG/L	4	.750000	.016667	.129102	.172136	.064551	.900000	.600000	70/05/08	70/07/30
00930	SODIUM	NA,DISS	MG/L	4	64.5000	203.000	14.2478	.220896	7.12390	77.0000	44.0000	70/05/08	70/07/30
00935	POTSSIUM	K,DISS	MG/L	4	6.14999	2.63013	1.62177	.198990	.810883	9.60000	5.90000	70/05/06	70/07/30
00940	CHLORIDE	CL	MG/L	4	45.0000	115.333	10.7393	.238652	5.36967	52.0000	29.0000	70/05/08	70/07/30
00945	SULFATE	SO4	MG/L	4	17.2500	38.2500	6.18466	.358531	3.09233	26.0000	12.0000	70/05/08	70/07/30
00950	FLUORIDE	F,DISS	MG/L	4	5.75000	2.77670	1.66634	.289799	.833172	6.80000	3.30000	70/05/08	70/07/30
00955	SILICA	DISSLVED	MG/L	2	92.0000	50.0000	7.07107	.076859	5.00000	97.0000	87.0000	70/07/21	70/07/30
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01045	IRON	TOTAL	UG/L	4	360.000	56733.3	238.188	.661632	119.094	700.000	190.000	70/05/08	70/07/30
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
01055	MANGNESE	MN	UG/L	4	22.5000	691.666	26.2996	1.16887	13.1498	50.0000	.000000	70/05/06	70/07/30
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/30
31501	TOT COLI	MFIENDO	/100ML	6	181.000	17142.0	130.927	.723356	53.4509	390.000	76.0000	70/05/16	70/05/27
31616	FEC COLI	MFM-FCBR	/100ML	12	96.0000	9390.91	96.9067	1.00944	27.9745	350.000	12.0000	70/05/18	70/08/19
31673	FECSTREP	MFKFBGAR	/100ML	6	56.1667	584.170	24.1696	.415524	9.86720	79.0000	18.0000	70/08/12	70/08/19
70507	PHOS-T	ORTHO	MG/L P	4	.090750	.003322	.057639	.635141	.028820	.128000	.005000	70/05/06	70/07/30

START DATE 72/11/23

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GIBBON R. NEAR FIREHOLE R. JUNC.
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MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	18	11.3889	13.3987	3.66042	.321403	.862770	17.0000	7.00000	70/05/08	70/08/19
00020	AIR	TEMP	CENT	16	11.9167	53.6344	7.32492	.614078	1.72650	25.0000	2.00000	70/05/08	70/08/19
00060	STREAM	FLOW	CFS	3	146.000	993.000	31.5119	.215835	18.1934	178.000	115.000	70/07/21	70/08/19
00070	TURB	JKSN	JTU	4	2.35000	5.61666	2.36995	1.00849	1.18497	5.60000	.700000	70/05/08	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	4	263.750	3296.25	57.4130	.217679	28.7065	306.000	179.000	70/05/08	70/08/03
00300	DO		MG/L	4	8.02499	.115885	.340419	.042420	.170210	8.30000	7.60000	70/05/08	70/08/03
00310	BOD	2 DAY	MG/L	4	.725000	.075634	.275379	.379833	.137690	1.00000	.400000	70/05/20	70/08/12
00400	PH		SU	4	1.20000	.246668	.496657	.413881	.248328	1.80000	.600000	70/05/20	70/08/12
00403	LAB	PH	SU	4	6.95000	.056707	.238132	.034264	.119066	7.20000	6.70000	70/05/08	70/08/03
00410	T ALK	CACO3	MG/L	10	7.07999	.139594	.373623	.052772	.118150	8.00000	6.70000	70/05/08	70/08/17
00500	RESIDUE	TOTAL	MG/L	5	75.0000	426.000	20.6398	.275197	9.23039	91.0000	39.0000	70/05/08	70/08/17
00515	RESIDUE	DISS-105	C MG/L	4	243.750	2476.92	49.7686	.204179	24.8843	299.000	178.000	70/05/08	70/08/03
00610	NH3-N	TOTAL	MG/L	4	200.250	4346.25	65.9261	.329219	32.9630	273.000	127.000	70/05/08	70/08/03
00625	TOT KJEL	N	MG/L	4	.020000	.000333	.018257	.912871	.009129	.040000	.000000	70/05/08	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	4	.157500	.014692	.121209	.769582	.060605	.280000	.030000	70/05/08	70/08/03
00665	PHOS-T	P-WET	MG/L	4	.040000	.000067	.008165	.204128	.004083	.050000	.030000	70/05/08	70/08/03
00680	T ORG C	C	MG/L	4	.050000	.000467	.021603	.432050	.010801	.070000	.020000	70/05/08	70/08/03
00915	CALCIUM	CA,DISS	MG/L	4	7.22500	8.54253	2.92276	.404534	1.46138	10.0000	4.70000	70/05/08	70/08/03
00925	MGNSIUM	MG,DISS	MG/L	4	6.90000	.366699	.605557	.087762	.302778	7.70000	6.30000	70/05/08	70/08/03
00930	SODIUM	NA,DISS	MG/L	4	1.17500	.089168	.298609	.254136	.149305	1.50000	.800000	70/05/08	70/08/03
00935	POTSSIUM	K,DISS	MG/L	4	44.0000	127.333	11.2842	.256459	5.64210	54.0000	25.0000	70/05/08	70/08/03
00940	CHLORIDE	CL	MG/L	4	8.02499	3.16927	1.78024	.221837	.890122	9.30000	5.40000	70/05/08	70/08/03
00945	SULFATE	SO4	MG/L	4	30.0000	90.0000	9.48683	.316228	4.74342	42.0000	19.0000	70/05/08	70/08/03
00950	FLUORIDE	F,DISS	MG/L	4	21.5000	99.0000	9.94987	.462785	4.97494	36.0000	15.0000	70/05/08	70/08/03
00955	SILICA	DISOLVED	MG/L	4	3.20000	1.15334	1.07393	.335605	.536967	3.90000	1.60000	70/05/08	70/08/03
01005	BARIUM	BA,DISS	UG/L	2	75.5000	180.500	13.4350	.177947	9.50000	85.0000	66.0000	70/07/21	70/08/03
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01045	IRON	TOTAL	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01049	LEAD	PB,DISS	UG/L	4	562.500	64025.0	253.032	.449834	126.516	850.000	340.000	70/05/08	70/08/03
01055	MANGNESE	MN	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01090	ZINC	ZN,DISS	UG/L	4	55.0000	1633.33	40.4145	.734809	20.2073	90.0000	.000000	70/05/08	70/08/03
09503	RA-226	DISOLVED	PC/L	1	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
22703	U-NAT	DISOLVED	UG/L	1	.010000					.010000	.010000	70/05/08	70/05/08
31501	TOT COLI	MFIMENDO	/100ML	1	.800000					.800000	.800000	70/05/08	70/05/08
31616	FEC COLI	MFM-FCBR	/100ML	7	169.714	20147.2	141.941	.836353	53.6486	440.000	48.0000	70/05/18	70/05/29
31673	FECSTREP	MFKFAGAR	/100ML	14	57.5000	5360.73	73.2170	1.27334	19.5681	220.000	1.00000	70/05/18	70/08/19
70507	PHOS-T	ORTHO	MG/L P	7	77.2857	6447.57	80.2968	1.03896	30.3493	196.000	10.0000	70/08/09	70/08/19
				4	.044000	.000739	.027176	.617693	.013589	.062000	.004000	70/05/08	70/08/03

STORET DATE 72/11/23

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GIBBON R. AT GIBBON R. RAPIDS
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MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	16	10.7500	16.5333	4.06612	.378244	1.01653	17.5000	5.00000	70/05/08	70/08/19
00020	AIR	TEMP	CENT	16	13.2500	41.5333	6.44464	.486388	1.61116	23.0000	1.00000	70/05/08	70/08/19
00070	TURB	JKSN	JTU	4	2.10000	2.14666	1.46515	.697690	.732574	4.20000	1.00000	70/05/08	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	4	247.750	6340.25	79.6257	.321395	39.8128	314.000	133.000	70/05/08	70/08/03
00300	DO		MG/L	4	8.09999	.086751	.294536	.036362	.147268	8.40000	7.60000	70/05/08	70/08/03
00304	BOD	2 DAY	MG/L	3	.733333	.083334	.288677	.393651	.166668	.900000	.400000	70/05/20	70/08/09
00310	BOD	5 DAY	MG/L	3	1.50000	.190002	.435893	.290595	.251663	2.00000	1.20000	70/05/20	70/08/09
00400	PH		SU	4	6.72499	.039244	.298737	.044422	.149368	7.10000	6.40000	70/05/08	70/08/03
00403	LAB	PH	SU	9	7.00000	.362518	.602095	.086014	.200698	8.50000	6.50000	70/05/03	70/08/17
00410	T ALK	CACO3	MG/L	5	50.0000	297.000	17.2337	.344674	7.70714	66.0000	21.0000	70/05/08	70/08/17
00500	RESIDUE	TOTAL	MG/L	4	225.500	3233.00	56.8595	.252148	28.4297	291.000	153.000	70/05/08	70/08/03
00515	RESIDUE	DISS-105	C MG/L	4	205.500	5667.00	75.2795	.366323	37.6397	291.000	114.000	70/05/08	70/08/03
00610	NH3-N	TOTAL	MG/L	4	.032500	.000425	.020616	.634324	.010308	.060000	.010000	70/05/08	70/08/03
00625	TOT KJEL	N	MG/L	4	.397500	.300624	.548474	1.37981	.274237	1.20000	.030000	70/05/08	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	4	.035000	.000100	.010000	.285717	.005000	.040000	.020000	70/05/08	70/08/03
00665	PHOS-T	P-WET	MG/L	4	.082500	.003492	.059090	.716248	.029545	.160000	.020000	70/05/08	70/08/03
00680	T ORG C	C	MG/L	4	4.15000	.783345	.885068	.213269	.442534	5.10000	3.30000	70/05/08	70/08/03
00915	CALCIUM	CA,DISS	MG/L	4	6.25000	.996719	.998358	.159737	.499179	7.30000	4.90000	70/05/08	70/08/03
00925	MGNSIUM	MG,DISS	MG/L	4	1.20000	.126666	.355902	.296565	.177951	1.50000	.700000	70/05/08	70/08/03
00930	SODIUM	NA,DISS	MG/L	4	37.5000	191.000	13.8203	.368541	6.91014	52.0000	19.0000	70/05/08	70/08/03
00935	PTSSIUM	K,DISS	MG/L	4	7.87500	5.96248	2.44182	.310073	1.22091	9.70000	4.30000	70/05/08	70/08/03
00940	CHLORIDE	CL	MG/L	4	38.5000	47.0000	6.85565	.178069	3.42783	48.0000	33.0000	70/05/08	70/08/03
00945	SULFATE	SO4	MG/L	4	24.5000	107.000	10.3441	.422207	5.17204	40.0000	19.0000	70/05/08	70/08/03
00950	FLUORIDE	F,DISS	MG/L	4	2.37500	.902506	.950003	.400002	.475002	3.10000	1.00000	70/05/08	70/08/03
00955	SILICA	DISOLVED	MG/L	2	70.0000	18.0000	4.24264	.060609	3.00000	73.0000	67.0000	70/07/21	70/08/03
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01045	IRON	TOTAL	UG/L	4	580.000	80133.3	283.078	.488066	141.539	950.000	330.000	70/05/08	70/08/03
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01055	MANGNESE	MN	UG/L	4	40.0000	1133.33	33.6650	.841625	16.8325	80.0000	.000000	70/05/08	70/08/03
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
31501	TOT COLI	MFI MENBD	/100ML	6	51.0000	702.400	26.5028	.519663	10.8197	93.0000	20.0000	70/05/18	70/09/29
31616	FEC COLI	MFM-FCBR	/100ML	12	18.5833	306.447	17.5056	.942007	5.05344	60.0000	6.00000	70/05/18	70/08/19
31673	FECSTREP	MFKFAGAR	/100ML	6	17.6667	43.4671	6.59296	.373187	2.69156	26.0000	7.00000	70/08/09	70/08/19
70507	PHOS-T	ORTHO	MG/L P	4	.050000	.001283	.035814	.716288	.017907	.086000	.002000	70/05/08	70/08/03

STORET DATE 72/11/29

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GIBBON RIVER BELOW NORRIS CAMPGR
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MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	15	9.66667	29.2024	5.40392	.559027	1.39529	23.0000	3.00000	70/05/07	70/08/19
00020	AIR	TEMP	CENT	16	13.2500	32.6000	5.70964	.430916	1.42741	20.0000	1.00000	70/05/07	70/08/19
00060	STREAM	FLOW	CFS	3	71.0000	147.000	12.1244	.170765	7.00000	84.0000	60.0000	70/07/21	70/08/18
00070	TURB	JKSN	JTU	4	1.50000	.420002	.648076	.432051	.324038	2.20000	.900000	70/05/07	70/08/02
00095	CNDUCTVY	AT 25C	MICROMHO	4	90.2500	614.250	24.7841	.274616	12.3920	113.000	55.0000	70/05/07	70/08/02
00300	DO		MG/L	4	8.02500	.075846	.275402	.034318	.137701	8.30000	7.70000	70/05/07	70/08/02
00304	BOD	2 DAY	MG/L	3	.733333	.053334	.230942	.314921	.133334	1.00000	.600000	70/05/20	70/08/09
00310	BOD	5 DAY	MG/L	3	1.23333	.053334	.230942	.187250	.133334	1.50000	1.10000	70/05/20	70/08/09
00400	PH		SU	4	6.72500	.195857	.442557	.065808	.221276	7.20000	6.30000	70/05/07	70/08/02
00403	LAB	PH	SU	9	6.81111	.116119	.340763	.050030	.113583	7.20000	6.20000	70/05/07	70/08/17
00410	T ALK	CACO3	MG/L	5	30.4000	92.8008	9.63332	.316885	4.30815	41.0000	15.0000	70/05/07	70/08/17
00500	RESIDUE	TOTAL	MG/L	4	107.500	689.000	26.2488	.244175	13.1244	139.000	75.0000	70/05/07	70/08/02
00515	RESIDUE	DISS-105	C MG/L	4	66.7500	1111.58	33.3404	.499482	16.6702	112.000	32.0000	70/05/07	70/08/02
00610	NH3-N	TOTAL	MG/L	4	.017500	.000225	.015000	.857143	.007500	.030000	.000000	70/05/07	70/08/02
00625	TOT KJEL	N	MG/L	4	.162500	.034758	.186436	1.14730	.093218	.430000	.000000	70/05/07	70/08/02
00630	NO2&NO3	N-TOTAL	MG/L	4	.025000	.000567	.023805	.952189	.011902	.060000	.010000	70/05/07	70/08/02
00665	PHOS-T	P-WET	MG/L	4	.037500	.000425	.020616	.549749	.010308	.060000	.010000	70/05/07	70/08/02
00680	T ORG C	C	MG/L	4	4.02500	3.50918	1.87329	.465412	.936640	6.70000	2.40000	70/05/07	70/08/02
00915	CALCIUM	CA,DISS	MG/L	4	5.00000	.326706	.571582	.114316	.285791	5.70000	4.40000	70/05/07	70/08/02
00925	MGNSIUM	MG,DISS	MG/L	4	.775000	.029167	.170784	.220367	.085392	1.00000	.600000	70/05/07	70/08/02
00930	SODIUM	NA,DISS	MG/L	4	11.0250	16.3359	4.04177	.366601	2.02089	16.0000	6.10000	70/05/07	70/08/02
00935	PTSSIUM	K,DISS	MG/L	4	3.55000	.896662	.946923	.266739	.473461	4.30000	2.20000	70/05/07	70/08/02
00940	CHLORIDE	CL	MG/L	4	7.75000	30.2500	5.50000	.709677	2.75000	15.0000	3.00000	70/05/07	70/08/02
00945	SULFATE	SO4	MG/L	4	11.6000	32.0534	5.66157	.488067	2.83078	19.0000	6.60000	70/05/07	70/08/02
00950	FLUORIDE	F,DISS	MG/L	4	1.30000	.453336	.673302	.374057	.336651	2.20000	.800000	70/05/07	70/08/02
00955	SILICA	DISSOLVED	MG/L	2	39.5000	.500000	.707107	.017901	.500000	40.0000	39.0000	70/07/21	70/08/02
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/02
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/02
01045	IRON	TOTAL	UG/L	4	292.500	42891.7	207.103	.708045	103.552	600.000	150.000	70/05/07	70/08/02
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/02
01055	MANGNESE	MN	UG/L	4	30.0000	1466.67	38.2971	1.27657	19.1485	80.0000	.000000	70/05/07	70/08/02
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/02
31501	TOT COLI	MFI MENDO	/100ML	6	54.8333	3462.57	58.8436	1.07314	24.0228	170.000	12.0000	70/05/18	70/05/29
31616	FEC COLI	MFM-FCBR	/100ML	12	21.5000	935.545	30.5867	1.42264	8.82961	110.000	2.00000	70/05/18	70/08/19
31673	FECSTREP	MFKFAGAR	/100ML	6	16.5000	225.500	15.0167	.910100	6.13052	45.0000	5.00000	70/08/09	70/08/19
70507	PHOS-T	ORTHO	MG/L P	4	.010750	.000201	.014175	1.31856	.007087	.031000	.000000	70/05/07	70/08/02

STORET DATE 72/11/29

571040
44 35 30.0 110 52 15.0 3
FIREHOLE R. AT MADISON JUNCTION
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
6000

INDEX 1021500
MILES 1143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	15	15.0000	16.1071	4.01337	.267556	1.03625	21.0000	9.00000	70/05/08	70/08/19
00020	AIR	TEMP	CENT	15	10.0667	38.0667	6.16982	.612896	1.59304	24.0000	3.00000	70/05/06	70/08/19
00070	TURB	JKSN	JTU	4	1.47500	1.50917	1.22844	.832870	.614241	3.20000	.500000	70/05/08	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	4	388.000	6042.00	77.7303	.200336	38.8651	454.000	283.000	70/05/08	70/08/03
00300	DO		MG/L	4	7.49999	.526794	.725806	.096774	.362903	8.30000	6.60000	70/05/06	70/08/03
00304	BOD	2 DAY	MG/L	3	.566667	.003333	.057736	.101887	.033334	.600000	.500000	70/05/20	70/08/12
00310	BOD	5 DAY	MG/L	3	1.10000	.090000	.300000	.272728	.173205	1.40000	.800000	70/05/20	70/08/12
00400	PH		SU	4	7.62500	.215397	.464647	.060937	.232523	8.10000	7.00000	70/05/08	70/08/03
00403	LAB	PH	SU	8	7.50000	.077183	.277819	.035167	.098224	8.30000	7.50000	70/05/08	70/08/17
00410	T ALK	CACO3	MG/L	5	99.4000	311.308	17.6439	.177504	7.89059	109.000	68.0000	70/05/08	70/08/17
00500	RESIDUE	TOTAL	MG/L	4	325.750	3114.92	55.8114	.171332	27.9057	366.000	244.000	70/05/08	70/08/03
00515	RESIDUE	DISS-105	C MG/L	4	300.500	3622.33	60.1858	.200286	30.0929	343.000	213.000	70/05/08	70/08/03
00610	NH3-N	TOTAL	MG/L	4	.012500	.000092	.009574	.765941	.004787	.020000	.000000	70/05/08	70/08/03
00625	TOT KJEL	N	MG/L	4	.635000	1.23957	1.11336	1.75332	.556679	2.30000	.000000	70/05/06	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	4	.007500	.000092	.009574	1.27657	.004787	.020000	.000000	70/05/06	70/08/03
00665	PHOS-T	P-WET	MG/L	4	.135000	.005100	.071414	.528995	.035707	.190000	.030000	70/05/08	70/08/03
00680	T ORG C	C	MG/L	3	5.73333	8.36339	2.89195	.504410	1.66967	8.30000	2.60000	70/05/06	70/08/03
00915	CALCIUM	CA,DISS	MG/L	4	5.27500	.175852	.419348	.079497	.209674	5.70000	4.70000	70/05/08	70/08/03
00925	MGNSIUM	MG,DISS	MG/L	4	.525000	.002500	.050002	.095242	.025001	.600000	.500000	70/05/06	70/08/03
00930	SODIUM	NA,DISS	MG/L	4	73.5000	192.333	13.8684	.188686	6.93421	86.0000	55.0000	70/05/08	70/08/03
00935	POTSSIUM	K,DISS	MG/L	4	7.85000	2.89668	1.70196	.216311	.850981	9.30000	5.80000	70/05/06	70/08/03
00940	CHLORIDE	CL	MG/L	4	44.5000	807.000	28.4077	.638376	14.2039	81.0000	2.00000	70/05/06	70/08/03
00945	SULFATE	SO4	MG/L	4	15.0000	36.6667	6.05530	.403687	3.02765	24.0000	11.0000	70/05/08	70/08/03
00950	FLUORIDE	F,DISS	MG/L	4	7.69999	3.32012	1.82212	.236639	.911060	8.80000	5.00000	70/05/08	70/08/03
00955	SILICA	DISOLVED	MG/L	2	107.500	12.5000	3.53553	.032889	2.50000	110.000	105.000	70/07/21	70/08/03
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/06	70/08/03
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01045	IRON	TOTAL	UG/L	4	117.500	10558.3	102.759	.874500	51.3769	250.000	.000000	70/05/08	70/08/03
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/06	70/08/03
01055	MANGNESE	MN	UG/L	4	12.5000	625.000	25.0000	2.00000	12.5000	50.0000	.000000	70/05/08	70/08/03
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/06	70/08/03
31501	TOT COLI	MFI MENDO	/100ML	6	116.667	27338.3	165.343	1.41722	67.5009	450.000	30.0000	70/05/18	70/05/27
31616	FEC COLI	MFM-FCBR	/100ML	11	44.0909	2495.09	49.9509	1.13291	15.0608	170.000	14.0000	70/05/18	70/08/19
31673	FECSTREP	MFKFBGAR	/100ML	5	76.6000	2488.31	49.8829	.651213	22.3083	158.000	31.0000	70/08/12	70/08/19
70507	PHOS-T	ORTHO	MG/L P	4	.113750	.005860	.076552	.639267	.038276	.160000	.005000	70/05/08	70/08/03
71900	MERCURY	HG,TOTAL	UG/L	4	1.47500	.235833	.485627	.329239	.242813	2.10000	1.00000	70/05/08	70/08/03

STORET [illegible] 72/11/[illegible]

571041
+4 23 23.0 110 50 51.[illegible] :
FIREHOLE R. BELOW LITTLE FIRE R.
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
111MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	15	13.6000	20.2072	4.49524	.325742	1.16067	20.0000	5.50000	70/05/08	70/06/19
00020	AIR	TEMP	CENT	15	11.6667	69.6055	8.35521	.716161	2.15731	32.0000	3.00000	70/05/08	70/08/19
00070	TURB	JKSN	JTU	4	1.12500	.849168	.921503	.819115	.460752	2.40000	.400000	70/05/08	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	4	237.750	1764.92	42.0109	.176702	21.0054	277.000	179.000	70/05/08	70/08/03
00300	DO		MG/L	4	7.77433	.215937	.464690	.059767	.232345	8.40000	7.30000	70/05/08	70/08/03
00310	BOD	2 DAY	MG/L	3	.633333	.043334	.208169	.328669	.120187	.800000	.400000	70/05/20	70/08/12
00310	BOD	5 DAY	MG/L	3	.900000	.210000	.458258	.509175	.264575	1.30000	.400000	70/05/20	70/08/12
00400	PH		SU	4	7.67500	.062581	.250163	.032595	.125081	8.00000	7.40000	70/05/08	70/08/03
00403	LAB	PH	SU	6	7.73749	.378455	.615185	.076997	.217501	9.20000	7.30000	70/05/08	70/06/17
00410	T ALK	CACO3	MG/L	5	62.6000	132.305	11.5024	.183744	5.14402	73.0000	43.0000	70/05/08	70/06/17
00500	RESIDUE	TOTAL	MG/L	4	217.500	1679.00	40.9756	.188394	20.4878	254.000	159.000	70/05/08	70/08/03
00515	RESIDUE	DISS-105	C MG/L	4	195.250	1763.58	42.2325	.216300	21.1162	218.000	132.000	70/05/08	70/08/03
00610	NH3-N	TOTAL	MG/L	4	.010000	.000067	.008165	.816496	.004082	.020000	.000000	70/05/08	70/08/03
00625	TOT KJEL	N	MG/L	4	.062500	.002025	.045000	.720000	.022500	.100000	.010000	70/05/08	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	4	.010000	.000133	.011547	1.15470	.005773	.020000	.000000	70/05/08	70/08/03
00665	PHOS-T	P-WET	MG/L	4	.105000	.006667	.081035	.771761	.040517	.220000	.030000	70/05/08	70/08/03
00680	T ORG C	C	MG/L	4	6.52499	10.2626	3.20353	.490963	1.60176	11.0000	3.80000	70/05/08	70/08/03
00915	CALCIUM	CA,DISS	MG/L	4	4.20000	.066691	.258246	.061487	.129123	4.50000	3.90000	70/05/08	70/08/03
00925	MGNSIUM	MG,DISS	MG/L	4	.400000	.000000	.000345	.000863	.000173	.400000	.400000	70/05/08	70/08/03
00930	SODIUM	NA,DISS	MG/L	4	44.5000	59.0000	7.68115	.172610	3.84057	49.0000	33.0000	70/05/08	70/08/03
00935	POTSSIUM	K,DISS	MG/L	4	5.15000	1.47001	1.21244	.235425	.606219	6.60000	4.10000	70/05/08	70/08/03
00940	CHLORIDE	CL	MG/L	4	31.5000	51.0000	7.14143	.226712	3.57071	36.0000	21.0000	70/05/08	70/08/03
00945	SULFATE	SO4	MG/L	4	9.65000	14.4901	3.80658	.394465	1.90329	14.0000	5.00000	70/05/08	70/08/03
00950	FLUORIDE	F,DISS	MG/L	4	5.15000	1.89569	1.37720	.267418	.688601	6.50000	3.30000	70/05/08	70/08/03
00955	SILICA	DISSLVED	MG/L	2	83.5000	12.5000	3.53553	.042342	2.50000	86.0000	81.0000	70/07/21	70/08/03
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01045	IRON	TOTAL	UG/L	4	75.0000	7500.00	86.6025	1.15470	43.3013	150.000	.000000	70/05/08	70/08/03
01049	LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/08/03
01055	MANGNESE	MN	UG/L	4	17.5000	425.000	20.6155	1.17803	10.3078	40.0000	.000000	70/05/08	70/08/03
01090	ZINC	ZN,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/05/23	70/06/03
31501	TOT COLI	MFIMENDO	/100ML	6	94.6667	6506.67	80.6639	.852084	32.9309	240.000	40.0000	70/05/18	70/05/27
31616	FEC COLI	MFM-FCBR	/100ML	11	38.3636	1275.66	35.7163	.930994	10.7689	120.000	8.00000	70/05/18	70/08/19
31673	FECSTREP	MFKFASAR	/100ML	5	46.0000	551.500	23.4840	.510523	10.5024	77.0000	21.0000	70/08/12	70/08/19
70507	PHOS-T	ORTHO	MG/L P	4	.057750	.001254	.035406	.613090	.017703	.080000	.005000	70/05/08	70/08/03
71900	MERCURY	HG,TOTAL	UG/L	5	1.94000	1.13800	1.06677	.549882	.477075	3.40000	.500000	70/05/08	71/04/06

STORET DATE 72/12/31

571042
44 27 30.0 110 49 00.0 3
FIREHOLE R. NEAR KEPLER CASCADES
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021000
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	15	8.96667	13.0981	3.61775	.403466	.934099	16.0000	3.50000	70/05/08	70/08/19
00020	AIR	TEMP	CENT	15	10.9667	50.1595	7.08234	.645806	1.82865	26.0000	3.00000	70/05/08	70/08/19
00060	STREAM	FLOW	CFS	4	80.7499	1514.68	38.9189	.481968	19.4594	139.000	58.3000	70/05/23	70/08/18
00070	TURB	JKSN	JTU	4	1.52500	1.36917	1.17863	.772872	.589314	3.20000	.700000	70/05/08	70/08/03
00095	CNDUCTVY	AT 25C	MICROMHO	4	97.5000	283.000	16.8226	.172539	8.41130	113.000	74.0000	70/05/06	70/09/03
00300	DO		MG/L	4	8.35000	.056641	.237993	.028502	.118996	8.50000	8.00000	70/05/08	70/08/03
00310	BOD	2 DAY	MG/L	3	.400000	.040000	.200001	.500002	.115470	.600000	.200000	70/05/20	70/06/12
00400	PH		SU	4	7.34999	.123428	.351324	.047799	.175662	7.70000	7.00000	70/05/20	70/08/12
00402	LAB	PH	SU	8	6.97499	.165039	.406250	.058244	.143631	7.70000	6.40000	70/05/08	70/08/17
00410	T ALK	CACO3	MG/L	5	21.4000	21.3003	4.61523	.215665	2.06399	28.0000	15.0000	70/05/08	70/08/17
00500	RESIDUE	TOTAL	MG/L	3	114.000	507.000	22.5167	.197515	13.0000	140.000	101.000	70/05/23	70/08/03
00515	RESIDUE	DISS-105	C MG/L	4	86.2500	422.250	20.5487	.238246	10.2744	102.000	57.0000	70/05/08	70/08/03
00610	NH3-N	TOTAL	MG/L	4	.017500	.000155	.012583	.719032	.006292	.030000	.000000	70/05/08	70/08/03
00625	TOT KJEL	N	MG/L	4	.100000	.003457	.092014	.920143	.046007	.230000	.030000	70/05/08	70/08/03
00630	NO2&NO3	N-TOTAL	MG/L	4	.010000	.000200	.014142	1.41421	.007071	.030000	.000000	70/05/08	70/08/03
00665	PHOS-T	P-WET	MG/L	4	.125000	.013633	.116762	.934095	.058381	.280000	.030000	70/05/08	70/08/03
00680	T ORG C	C	MG/L	4	3.17500	3.86250	1.96532	.619000	.982662	6.10000	1.90000	70/05/05	70/08/03
00915	CALCIUM	CA,DISS	MG/L	4	3.35000	.016663	.129034	.038532	.064542	3.50000	3.20000	70/05/08	70/08/03
00925	MAGNSIUM	MG,DISS	MG/L	4	.425000	.002500	.050003	.117654	.025001	.500000	.400000	70/05/08	70/08/03
00930	SODIUM	NA,DISS	MG/L	4	14.2500	6.25000	2.50000	.175439	1.25000	17.0000	11.0000	70/05/08	70/08/03
00935	POTSSIUM	K,DISS	MG/L	4	3.55000	.283330	.532288	.149940	.266144	4.20000	2.90000	70/05/08	70/08/03
00940	CHLORIDE	CL	MG/L	4	13.0000	18.6667	4.32049	.332346	2.16025	19.0000	9.00000	70/05/08	70/08/03
00945	SULFATE	SO4	MG/L	4	6.57500	18.3092	4.27892	.499000	2.13946	14.0000	5.10000	70/05/08	70/08/03
00950	FLUORIDE	F,DISS	MG/L	4	2.12500	.309174	.556034	.261663	.278017	2.50000	1.30000	70/05/08	70/08/03
00955	SILICA	DISSOLVED	MG/L	2	59.0000	8.00000	2.82843	.054393	2.00000	54.0000	50.0000	70/07/21	70/08/03
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01042	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01045	IRON	TOTAL	UG/L	4	100.000	15000.0	122.474	1.22474	61.2372	250.000	.000000	70/05/08	70/08/03
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
01055	MANGNESE	MN	UG/L	4	12.5000	625.000	25.0000	2.00000	12.5000	50.0000	.000000	70/05/08	70/08/03
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/08/03
31501	TOT COLI	MFI4EWDO	/100ML	6	39.6667	261.468	16.1700	.407646	6.60136	66.0000	20.0000	70/05/18	70/05/27
31616	FEC COLI	MFM-FCBR	/100ML	11	23.5454	245.874	15.6804	.665962	4.72781	48.0000	4.00000	70/05/18	70/08/19
31673	FECSTREP	MFKFASAK	/100ML	5	19.4000	128.800	11.3490	.585001	5.07544	30.0000	7.00000	70/08/12	70/08/19
70507	PHOS-T	ORTHO	MG/L P	4	.079500	.007411	.086087	1.08286	.043044	.200000	.005000	70/05/08	70/08/03
71900	MERCURY	HG,TOTAL	UG/L	4	2.40000	1.25334	1.11952	.466469	.559762	3.40000	1.00000	70/05/08	71/04/06

STORET DATE 72/11/29

STATION 271043
46 23 00.0 110 10 00.0 3
SYLVAN LAKE AT EAST ENTRANCE RD.
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
121748R 77777777
0000

INDEX 1021000
MILES 1148.60

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	4	9.50000	121.000	11.0000	1.15769	5.50000	20.0000	.000000	70/05/07	70/08/01
00020	AIR	TEMP	CENT	4	16.0000	120.667	10.9848	.686552	5.49242	26.0000	6.00000	70/05/07	70/08/01
00070	TURB	JKSN	JTU	4	2.80000	14.4067	3.79561	1.30863	1.89780	8.50000	.500000	70/05/07	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	4	50.5000	500.333	22.3661	.395396	11.1641	75.0000	24.0000	70/05/07	70/08/01
00300	DO		MG/L	4	7.07500	1.74253	1.32005	.186560	.660025	7.80000	5.10000	70/05/07	70/08/01
00400	PH		SU	4	7.30000	.206741	.454668	.062286	.227344	7.90000	6.90000	70/05/07	70/08/01
00403	LAB	PH	SU	4	6.77500	.189169	.434970	.064202	.217485	7.20000	6.20000	70/05/07	70/08/01
00410	T ALK	CACO3	MG/L	4	26.7250	142.036	11.9179	.445946	5.95895	38.0000	9.90000	70/05/07	70/08/01
00500	RESIDUE	TOTAL	MG/L	3	82.0000	1216.00	34.8712	.425258	20.1329	122.000	52.0000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	3	53.3333	1332.34	36.5012	.684397	21.0740	90.0000	17.0000	70/05/07	70/08/01
00610	NH3-N	TOTAL	MG/L	4	.035000	.001233	.035119	1.00339	.017559	.070000	.000000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.107500	.001292	.035940	.334324	.017970	.140000	.060000	70/05/07	70/08/01
00630	NO2&NO3	N-TOTAL	MG/L	4	.020000	.000603	.024495	1.22474	.012247	.050000	.000000	70/05/07	70/08/01
00665	PHOS-T	P-TOT	MG/L	4	.052500	.003558	.059652	1.13622	.029826	.140000	.010000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	2.70000	4.11399	2.02978	.751770	1.01489	5.20000	.600000	70/05/07	70/08/01
00915	CALCIUM	CA,DISS	MG/L	4	7.90000	6.75335	2.59872	.328952	1.29936	11.0000	4.70000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	1.42500	.129168	.359400	.252210	.179700	1.70000	.900000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	1.87500	.649170	.805711	.429713	.402855	2.40000	.700000	70/05/07	70/08/01
00935	POTSIUM	K,DISS	MG/L	4	.400000	.020000	.141422	.353554	.070711	.600000	.300000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	4	2.35000	14.2433	3.77403	1.60597	1.88702	8.00000	.300000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	7.12500	.889231	.942931	.132350	.471495	8.00000	6.00000	70/05/07	70/08/01
00950	FLUORIDE	F,DISS	MG/L	4	.025000	.002500	.050000	2.00000	.025000	.100000	.000000	70/05/07	70/08/01
00955	SILICA	DISOLVED	MG/L	2	7.00000	.000000	.000000		.000000	7.00000	7.00000	70/07/19	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	300.000	180000	424.264	1.41421	212.132	900.000	.000000	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	32.5000	1556.33	39.4757	1.21464	19.7378	80.0000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
09503	RA-226	DISOLVED	PC/L	1	.010000					.010000	.010000	70/05/07	70/05/07
22703	U-NAT	DISOLVED	UG/L	1	.000000					.000000	.000000	70/05/07	70/05/07
73507	PHOS-T	ORTHO	MG/L P	4	.011250	.000229	.015130	1.34489	.007565	.033000	.000000	70/05/07	70/08/01

START DATE 72/1/2

571044
44 39 16.0 110 03 00.0 3
MIDDLE CR. AT EAST PARK BOUNDARY
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
111MBA 77777777
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INTEA 1027500
MILES 1140.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	4	6.00000	4.66667	2.24332	.490653	1.47196	9.00000	3.00000	70/05/07	70/08/01
00020	AIR	TEMP	CENT	4	14.0000	72.0000	8.48528	.606091	4.24264	24.0000	6.00000	70/05/07	70/08/01
00060	STREAM	FLOW	CFS	2	63.0000	1003.52	31.6784	.378929	22.4000	106.000	61.2000	70/07/19	70/08/01
00070	TURB	JKSN	JTU	4	1.72500	.989167	.994569	.576562	.497284	2.90000	.600000	70/05/07	70/08/01
00095	CNDUCTVY	AT 25C	MICROMHO	4	64.7500	64.2500	8.01561	.123793	4.00780	75.0000	57.0000	70/05/07	70/08/01
00300	DO		MG/L	4	9.50000	.140355	.374240	.039394	.187120	9.90000	9.00000	70/05/07	70/08/01
00400	PH		SU	4	7.20000	.180038	.424305	.058932	.212155	7.70000	6.80000	70/05/07	70/08/01
00403	LAB	PH	SU	4	7.05000	.243358	.493354	.069979	.246677	7.60000	6.50000	70/05/07	70/08/01
00410	T ALK	CACO3	MG/L	4	27.5000	35.0000	5.91608	.215130	2.95804	36.0000	23.0000	70/05/07	70/08/01
00500	RESIDUE	TOTAL	MG/L	3	123.667	6830.35	82.6459	.667660	47.7156	220.000	66.0000	70/05/07	70/08/01
00515	RESIDUE	DISS-105	C MG/L	3	84.0000	573.000	31.1929	.371345	18.0092	120.000	65.0000	70/05/07	70/08/01
00610	NH3-N	TOTAL	MG/L	4	.010000	.000200	.014142	1.41421	.007071	.030000	.000000	70/05/07	70/08/01
00625	TOT KJEL	N	MG/L	4	.122500	.014492	.120381	.982704	.060191	.280000	.010000	70/05/07	70/08/01
00630	NO3NO2	N-TOTAL	MG/L	4	.047500	.004359	.066018	1.38885	.033009	.140000	.000000	70/05/07	70/08/01
00665	PHOS-T	P-WET	MG/L	4	.067500	.002352	.053774	.796657	.026887	.140000	.010000	70/05/07	70/08/01
00680	T ORG C	C	MG/L	4	3.65000	6.99001	2.64386	.724346	1.32193	7.20000	.800000	70/05/07	70/08/01
00915	CALCIUM	CA,DISS	MG/L	4	6.72500	1.03565	1.01777	.151341	.508884	8.20000	6.00000	70/05/07	70/08/01
00925	MGNSIUM	MG,DISS	MG/L	4	1.45000	.003333	.057733	.039816	.028866	1.50000	1.40000	70/05/07	70/08/01
00930	SODIUM	NA,DISS	MG/L	4	5.17500	2.13249	1.45988	.281522	.729434	7.30000	4.00000	70/05/07	70/08/01
00935	PTSSIUM	K,DISS	MG/L	4	.750000	.036667	.191437	.255316	.095743	1.00000	.600000	70/05/07	70/08/01
00940	CHLORIDE	CL	MG/L	4	1.05000	1.77667	1.33292	1.26945	.666459	3.00000	.100000	70/05/07	70/08/01
00945	SULFATE	SO4	MG/L	4	9.90000	8.06004	2.83550	.286414	1.41775	14.0000	8.00000	70/05/07	70/08/01
00950	FLUORIDE	F,DISS	MG/L	4	.050000	.010000	.100000	2.00000	.050000	.200000	.000000	70/05/07	70/08/01
00955	SILICA	DISOLVED	MG/L	2	17.5000	.500000	.707107	.040406	.500000	18.0000	17.0000	70/07/19	70/08/01
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01045	IRON	TOTAL	UG/L	4	287.500	20356.3	142.683	.496287	71.3413	450.000	140.000	70/05/07	70/08/01
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
01055	MANGNESE	MN	UG/L	4	12.5000	625.000	25.0000	2.00000	12.5000	50.0000	.000000	70/05/07	70/08/01
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/07	70/08/01
09503	RA-226	DISOLVED	PC/L	1	.010000					.010000	.010000	70/05/07	70/05/07
22703	U-NAT	DISOLVED	UG/L	1	2.60000					2.60000	2.60000	70/05/07	70/05/07
70507	PHOS-T	TOTAL	MG/L P	4	.024000	.000032	.005140	1.04748	.012570	.060000	.002000	70/05/07	70/08/01

STREET DATE 72/11/[illegible]

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44 24 00.0 110 33 30.0 3
GRANT VILLAGE STP EFFLUENT
60 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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INDEX 1021500
MILES 1143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	5	13.2000	.200073	.447295	.033886	.200037	14.0000	13.0000	70/07/30	70/08/03
00020	AIR	TEMP	CENT	5	15.3000	3.20007	1.79867	.116920	.300009	18.0000	13.5000	70/07/30	70/08/03
00070	TURB	JKSN	JTU	5	32.2000	275.201	16.5892	.515192	7.41891	60.0000	20.0000	70/07/31	70/08/12
00095	CNDUCTVY	AT 25C	MICROMHO	1	785.000					785.000	785.000	70/08/03	70/08/03
00304	BOD	2 DAY	MG/L	2	21.5000	.500000	.707107	.032889	.500000	22.0000	21.0000	70/07/31	70/08/02
00310	BOD	5 DAY	MG/L	4	96.2500	8422.91	91.7764	.953521	45.8882	232.000	34.0000	70/07/31	70/08/12
00403	LAB	PH	SU	5	7.45999	.133118	.364853	.048903	.163167	8.10000	7.20000	70/07/31	70/08/12
00410	T ALK	CACO3	MG/L	3	137.000	28.0000	5.29150	.023297	3.05505	191.000	181.000	70/07/31	70/08/03
00500	RESIDUE	TOTAL	MG/L	1	392.000					392.000	392.000	70/08/03	70/08/03
00515	RESIDUE	DISS-105	C MG/L	1	343.000					343.000	343.000	70/08/03	70/08/03
00610	NH3-N	TOTAL	MG/L	3	53.3333	24.3359	4.93315	.092496	2.84815	59.0000	50.0000	70/08/03	70/08/12
00625	TOT KJEL	N	MG/L	3	65.6667	116.336	10.7859	.164252	6.22725	78.0000	58.0000	70/08/03	70/08/12
00630	NO2&NO3	N-TOTAL	MG/L	3	.986666	.946534	.972900	.986047	.561704	2.00000	.060000	70/08/03	70/08/12
00665	PHOS-T	P-WET	MG/L	3	16.7333	.413618	.643287	.038443	.371402	17.2000	16.0000	70/08/03	70/08/12
00680	T ORG C	C	MG/L	1	50.0000					50.0000	50.0000	70/08/03	70/08/03
00940	CHLORIDE	CL	MG/L	1	2.00000					2.00000	2.00000	70/08/03	70/08/03
00945	SULFATE	SO4	MG/L	1	37.0000					37.0000	37.0000	70/08/03	70/08/03
00950	FLUORIDE	F,DISS	MG/L	1	.600000					.600000	.600000	70/08/03	70/08/03
00955	SILICA	DISOLVED	MG/L	1	16.0000					16.0000	16.0000	70/08/03	70/08/03
31616	FEC COLI	MEM-FCBR	/100ML	9	3022222	.462E+14	6797383	2.24913	2265794	.200E+08	1.00000	70/07/30	70/08/12
31673	FECSTREP	MEKFAGAR	/100ML	4	2700001	.404E+14	6356847	2.35513	2119615	.190E+08	1.00000	70/07/30	70/08/12
70507	PHOS-T	ORTHO	MG/L P	3	13.6667	.893555	.945260	.069167	.545756	14.4000	12.6000	70/08/03	70/08/12

STORET DATE 72/11/24

271066
44 32 00.0 110 26 00.0 3
BRIDGE BAY S.T.P.
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
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PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00070	TURB	JKSN	JTU	2	32.0000	1568.00	39.5980	1.23744	28.0000	60.0000	4.00000	70/08/13	70/08/13
00310	BOD	5 DAY	MG/L	2	220.500	48984.5	221.324	1.00374	156.500	377.000	64.0000	70/08/13	70/08/13
00403	LAB	PH	SU	2	8.05000	.125122	.353726	.043941	.250122	8.30000	7.80000	70/08/13	70/08/13
00610	NH3-N	TOTAL	MG/L	2	56.5000	264.500	16.2635	.287849	11.5000	68.0000	45.0000	70/08/13	70/08/13
00625	TOT KJEL	N	MG/L	2	85.0000	338.000	18.3848	.216291	13.0000	98.0000	72.0000	70/08/13	70/08/13
00630	NO2&NO3	N-TOTAL	MG/L	2	.355000	.151250	.388909	1.09552	.275000	.630000	.080000	70/08/13	70/08/13
00665	PHOS-T	P-WET	MG/L	2	10.5000	3.38028	1.83855	.175100	1.30005	11.8000	9.20000	70/08/13	70/08/13
31616	FEC COLI	MFM-FCBR	/100ML	3	1365946	.196E+13	1400781	1.02475	808741	2800000	840.000	70/08/13	70/08/13
31673	FECSTREP	MFKFAGAR	/100ML	3	3367664	.123E+15	.111E+08	1.32427	6412942	.210E+08	63000.0	70/08/13	70/08/13
70507	PHOS-T	ORTHO	MG/L P	2	7.80000	.000000	.000000		.000000	7.90000	7.80000	70/08/13	70/08/13

STORET DATE 78/11/28

571047
44 54 55.5 110 25 15.5 2
LOST CR BELOW ROOSEVELT LODGE
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	7.50000	24.5000	4.94975	.659966	3.50000	11.0000	4.00000	70/05/28	70/07/22
00020	AIR	TEMP	CENT	2	14.0000	.000000	.000000		.000000	14.0000	14.0000	70/05/28	70/07/22
00070	TURB	JKSN	JTU	1	1.00000					1.00000	1.00000	70/07/22	70/07/22
00095	CNDUCTVY	AT 25C	MICROMHO	1	97.0000					97.0000	97.0000	70/07/22	70/07/22
00300	DO		MG/L	1	9.10000					9.10000	9.10000	70/07/22	70/07/22
00400	PH		SU	1	7.40000					7.40000	7.40000	70/07/22	70/07/22
00403	LAB	PH	SU	1	7.80000					7.80000	7.80000	70/07/22	70/07/22
00410	T ALK	CACO3	MG/L	1	46.0000					46.0000	46.0000	70/07/22	70/07/22
00500	RESIDUE	TOTAL	MG/L	1	99.0000					99.0000	99.0000	70/07/22	70/07/22
00515	RESIDUE	DISS-105	C MG/L	1	80.0000					80.0000	80.0000	70/07/22	70/07/22
00610	NH3-N	TOTAL	MG/L	1	.030000					.030000	.030000	70/07/22	70/07/22
00625	TOT KJEL	N	MG/L	1	.010000					.010000	.010000	70/07/22	70/07/22
00630	NO2&NO3	N-TOTAL	MG/L	1	.200000					.200000	.200000	70/07/22	70/07/22
00665	PHOS-T	P-WET	MG/L	1	.030000					.030000	.030000	70/07/22	70/07/22
00680	T ORG C	C	MG/L	1	6.00000					6.00000	6.00000	70/07/22	70/07/22
00915	CALCIUM	CA,DISS	MG/L	1	9.10000					9.10000	9.10000	70/07/22	70/07/22
00925	MGNSIUM	MG,DISS	MG/L	1	2.20000					2.20000	2.20000	70/07/22	70/07/22
00930	SODIUM	NA,DISS	MG/L	1	6.90000					6.90000	6.90000	70/07/22	70/07/22
00935	PTSSIUM	K,DISS	MG/L	1	1.70000					1.70000	1.70000	70/07/22	70/07/22
00940	CHLORIDE	CL	MG/L	1	.700000					.700000	.700000	70/07/22	70/07/22
00945	SULFATE	SO4	MG/L	1	8.80000					8.80000	8.80000	70/07/22	70/07/22
00950	FLUORIDE	F,DISS	MG/L	1	.400000					.400000	.400000	70/07/22	70/07/22
00955	SILICA	DISOLVED	MG/L	1	31.0000					31.0000	31.0000	70/07/22	70/07/22
01005	BARIUM	BA,DISS	UG/L	1	.000000					.000000	.000000	70/07/22	70/07/22
01040	COPPER	CU-DISS	UG/L	1	.000000					.000000	.000000	70/07/22	70/07/22
01045	IRON	TOTAL	UG/L	1	.000000					.000000	.000000	70/07/22	70/07/22
01049	LEAD	PB,DISS	UG/L	1	.000000					.000000	.000000	70/07/22	70/07/22
01055	MANGNESE	MN	UG/L	1	.000000					.000000	.000000	70/07/22	70/07/22
01090	ZINC	ZN,DISS	UG/L	1	.000000					.000000	.000000	70/07/22	70/07/22
31501	TOT COLI	MFIMENDO	/100ML	1	40.0000					40.0000	40.0000	70/05/28	70/05/28
31616	FEC COLI	MFM-FCBR	/100ML	1	10.0000					10.0000	10.0000	70/05/28	70/05/28
70507	PHOS-T	ORTHO	MG/L P	1	.020000					.020000	.020000	70/07/22	70/07/22

STORET DATE 72/11/2

571046
44 31 35.7 110 24 05.0 2
YELLOWSTONE L. NR STEVENSON IS.
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	4	10.5000	21.5000	4.63681	.441601	2.31840	15.0000	6.50000	70/08/04	70/08/04
00070	TURB	JKSN	JTU	4	1.30000	1.02000	1.00995	.776885	.504975	2.40000	.300000	70/08/04	70/08/04
00095	CNDUCTVY	AT 25C	MICROMHO	4	94.7500	12.2500	3.50000	.036939	1.75000	100.000	93.0000	70/08/04	70/08/04
00300	DO		MG/L	4	8.26250	.229004	.478543	.057916	.239272	8.70000	7.80000	70/08/04	70/08/04
00403	LAB	PH	SU	4	7.59999	.026749	.163550	.021520	.081775	7.80000	7.40000	70/08/04	70/08/04
00410	T ALK	CACO3	MG/L	4	29.0000	1.33333	1.15470	.039817	.577350	30.0000	28.0000	70/08/04	70/08/04
00500	RESIDUE	TOTAL	MG/L	4	84.5000	348.333	18.6637	.220872	9.33184	105.000	63.0000	70/08/04	70/08/04
00515	RESIDUE	DISS-105	C MG/L	4	51.5000	109.667	10.4722	.203343	5.23609	61.0000	41.0000	70/08/04	70/08/04
00610	NH3-N	TOTAL	MG/L	4	.002500	.000025	.005000	2.00000	.002500	.010000	.000000	70/08/04	70/08/04
00625	TOT KJEL	N	MG/L	4	.060000	.004867	.069761	.872018	.034881	.150000	.020000	70/08/04	70/08/04
00630	NO2&NO3	N-TOTAL	MG/L	4	.010000	.000133	.011547	1.15470	.005773	.020000	.000000	70/08/04	70/08/04
00665	PHOS-T	P-WET	MG/L	4	.030000	.620E-09	.000025	.000831	.000012	.030000	.030000	70/08/04	70/08/04
00680	T ORG C	C	MG/L	3	2.26667	.263332	.513159	.226394	.296273	2.70000	1.70000	70/08/04	70/08/04
00940	CHLORIDE	CL	MG/L	4	5.00000	.000000	.000000		.000000	5.00000	5.00000	70/08/04	70/08/04
00945	SULFATE	SO4	MG/L	4	5.15000	.070028	.264627	.051384	.132314	5.50000	4.90000	70/08/04	70/08/04
00955	SILICA	DISOLVED	MG/L	4	9.50000	.333333	.577350	.060774	.288675	10.0000	9.00000	70/08/04	70/08/04
32730	PHENOLS		UG/L	1	4.00000					4.00000	4.00000	70/08/04	70/08/04
70507	PHOS-T	ORTHO	MG/L P	4	.022500	.000025	.005000	.222223	.002500	.030000	.020000	70/08/04	70/08/04

STORET DATE 72/11/[illegible]

571[illegible]
44 57 30.5 110 41 15.2 2
GARD. P AT MAMMOTH AREA INCEN.
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1140.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	10.5000	40.5000	6.36396	.606091	4.50000	15.0000	6.00000	70/05/28	70/08/11
00020	AIR	TEMP	CENT	2	21.0000	32.0000	5.65685	.269374	4.00000	25.0000	17.0000	70/05/28	70/08/11
00403	LAB	PH	SU	1	7.80000					7.80000	7.80000	70/08/11	70/08/11
31501	TOT COLI	MFIMENDO	/100ML	1	11.0000					11.0000	11.0000	70/05/28	70/05/28
31616	FEC COLI	MFM-FCBR	/100ML	2	6.00000	32.0000	5.65685	.942809	4.00000	10.0000	2.00000	70/05/28	70/08/11
31673	FECSTREP	MFKFAGAR	/100ML	1	102.000					102.000	102.000	70/08/11	70/08/11

STORET DATE 72/11/23

571053
44 56 25.3 110 41 10.0 2
GARDINER R. ABOVE MAMMOTH
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	9.50000	40.5000	6.36396	.669891	4.50000	14.0000	5.00000	70/05/28	70/08/11
00020	AIR	TEMP	CENT	2	22.5000	84.5000	9.19239	.408551	6.50000	29.0000	16.0000	70/05/28	70/08/11
00403	LAB	PH	SU	1	7.80000					7.80000	7.80000	70/08/11	70/08/11
31501	TOT COLI	MFI4ENDO	/100ML	1	40.0000					40.0000	40.0000	70/05/28	70/05/28
31616	FEC COLI	MFM-FCBR	/100ML	2	12.0000	242.000	15.5563	1.29636	11.0000	23.0000	1.00000	70/05/28	70/08/11
31673	FECSTREP	MFKFAGAR	/100ML	1	100.000					100.000	100.000	70/08/11	70/08/11

STORET DATE 72/1/7

571051
44 22 25.3 110 22 30.0 2
SERVICE RD 1.2 MI S OF FISH. BR.
55 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	7.50000	84.5000	9.19239	1.22565	6.50000	14.0000	1.00000	70/05/26	70/08/10
00020	AIR	TEMP	CENT	2	8.75000	6.12500	2.47487	.282343	1.75000	10.5000	7.00000	70/05/26	70/08/10
31501	TOT COLI	MFIMENDO	/100ML	1	10.0000					10.0000	10.0000	70/05/26	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	2	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/05/26	70/08/10
31673	FECSTREP	MFKFAGAR	/100ML	1	3.00000					3.00000	3.00000	70/08/10	70/08/10

START DATE 72/11/24

571052
44 31 55.5 110 23 30.5 2
YELLOWSTONE L. S OF FISH. BR.
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 102150)
MILES 1143.40)

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	8.00000	72.0000	8.48528	1.06066	6.00000	14.0000	2.00000	70/05/26	70/08/10
00020	AIR	TEMP	CENT	2	10.0000	18.0000	4.24264	.424264	3.00000	13.0000	7.00000	70/05/26	70/08/10
31616	FEC COLI	MEM-FCBR	/100ML	1	1.00000					1.00000	1.00000	70/08/10	70/08/10
31673	FECSTREP	MFKFAGAR	/100ML	1	6.00000					6.00000	6.00000	70/08/10	70/08/10

STORET DATE 72/11/2.

571053
44 32 50.5 110 19 10.3 2
YELLOWSTONE L. E. OF FISH. BR.
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 2143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	3	13.1667	103.063	10.1530	.771114	5.86184	20.0000	1.50000	70/05/26	70/08/15
00020	AIR	TEMP	CENT	3	12.3333	38.0335	6.17113	.480271	3.56293	18.0000	6.00000	70/05/26	70/08/15
00304	BOD	5 DAY	MG/L	1	7.80000					7.80000	7.80000	70/08/10	70/08/10
00403	LAB	PH	SU	1	7.80000					7.80000	7.80000	70/08/15	70/08/15
31501	TOT COLI	MFIMENDO	/100ML	1	180.000					180.000	180.000	70/05/26	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	2	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/05/26	70/08/10
31673	FECSTREP	MFKFAGAR	/100ML	1	28.0000					28.0000	28.0000	70/08/10	70/08/10

STORET DATE 72/12/31

571054
44 30 55.4 110 25 00.0 2
YELLOWSTONE L. S. OF FISH. BR.
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	7.75000	66.1250	8.13173	1.04925	5.75000	13.5000	2.00000	70/05/26	70/08/10
00020	AIR	TEMP	CENT	2	9.00000	8.00000	2.82843	.314270	2.00000	11.0000	7.00000	70/05/26	70/08/10
31501	TOT COLI	MFI MENDO	/100ML	1	1.00000					1.00000	1.00000	70/05/26	70/05/26
31616	FEC COLI	MEM-FCBR	/100ML	2	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/05/26	70/08/10
31673	FECSTREP	MFKFASAR	/100ML	1	28.0000					28.0000	28.0000	70/08/10	70/08/10

STORET DATE 72/11/29

971055
44 26 50.5 110 34 20.5 2
YELLOWSTONE L. S. OF FISH. BR.
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1147.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	8.75000	78.1250	8.83883	1.01015	6.25000	15.0000	2.50000	70/05/26	70/08/10
00020	AIR	TEMP	CENT	2	11.0000	.000000	.000000		.000000	11.0000	11.0000	70/05/26	70/08/10
31501	TOT COLI	MFIMENDO	/100ML	1	1.00000					1.00000	1.00000	70/05/26	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	2	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/05/26	70/08/10
31673	FECSTREP	MFKFAGAR	/100ML	1	2.00000					2.00000	2.00000	70/08/10	70/08/10

STORET DATE 72/1/2[illegible]

571050
44 30 40.0 110 16 45.5 2
YELLOWSTONE L. E OF FISH. BR.
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	3	12.1667	65.5835	9.25113	.760367	5.34114	18.0000	1.50000	70/05/26	70/08/15
00020	AIR	TEMP	CENT	3	12.0000	7.00000	2.64575	.220479	1.52752	14.0000	9.00000	70/05/26	70/08/15
00403	LAB	PH	SU	2	7.40000	-.152E-04	.000000		.000000	7.40000	7.40000	70/08/10	70/08/15
31501	TOT COLI	MFIMENDO	/100ML	1	10.0000					10.0000	10.0000	70/05/26	70/05/26
31616	FEC COLI	MFM-FCBR	/100ML	3	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/05/26	70/08/10
31673	FECSTREP	MFKFAGAR	/100ML	2	7.00000	72.0000	8.48528	1.21218	6.00000	13.0000	1.00000	70/08/10	70/08/10

ST[illegible] DATE [illegible]

[illegible]
[illegible]
MADISON [illegible] MADISON JCT.
[illegible]
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	3	14.0000	19.0000	4.35890	.311350	2.51661	17.0000	9.00000	70/05/27	70/08/15
00020	AIR	TEMP	CENT	3	15.0000	15.0000	4.00000	.250000	2.30940	20.0000	12.0000	70/05/27	70/08/15
00304	BOD	2 DAY	MG/L	1	.300000					.300000	.300000	70/08/12	70/08/12
00310	BOD	5 DAY	MG/L	1	.300000					.300000	.300000	70/08/12	70/08/12
00403	LAB	PH	SU	2	7.65000	.004990	.070637	.009234	.049948	7.70000	7.60000	70/08/12	70/08/15
31501	TOT COLI	MFIMENDO	/100ML	1	380.000					380.000	380.000	70/05/27	70/05/27
31615	FEC COLI	MFM-FCBR	/100ML	3	115.333	31441.3	177.317	1.53743	102.374	320.000	8.00000	70/05/27	70/08/15
31673	FECSTREP	MFKFADAR	/100ML	2	53.0000	200.000	14.1421	.266833	10.0000	63.0000	43.0000	70/08/12	70/08/15

STORET DATE 72/11/24

571053
44 42 30.4 110 44 20.5 2
GIBBON AT UPPER END OF ELK PARK
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	3	12.0000	37.0000	6.08276	.506697	3.51188	16.0000	5.00000	70/05/29	70/06/15
00020	AIR	TEMP	CENT	3	16.3333	66.3336	8.14455	.498646	4.70226	22.0000	7.00000	70/05/29	70/08/15
00300	BOD	2 DAY	MG/L	1	.400000					.400000	.400000	70/08/09	70/08/09
00310	BOD	5 DAY	MG/L	1	1.00000					1.00000	1.00000	70/08/09	70/08/09
00403	LAB	PH	SU	2	7.10000	.020020	.141490	.019926	.100049	7.20000	7.00000	70/06/09	70/08/15
31501	TOT COLI	MFIMENDC	/100ML	1	80.0000					80.0000	80.0000	70/05/29	70/05/29
31616	FEC COLI	MFM-FCBR	/100ML	1	10.0000					10.0000	10.0000	70/05/29	70/05/29

STORET [illegible]

[illegible]
44 42 50.5 110 41 35.5 [illegible]
GIBBON R UPSTN FRM NORRIS CAMP.
50 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	7	10.6429	10.9762	3.31304	.311292	1.25221	15.0000	4.00000	70/05/29	70/08/19
00020	AIR	TEMP	CENT	7	15.0000	15.3333	3.91578	.261052	1.48003	20.0000	10.0000	70/05/29	70/08/19
00060	STREAM	FLOW	CFS	3	60.3666	2762.36	52.5582	.870649	30.3445	121.000	27.8000	70/05/27	70/08/19
00304	BOD	2 DAY	MG/L	1	1.50000					1.50000	1.50000	70/08/09	70/08/09
00310	BOD	5 DAY	MG/L	1	2.50000					2.50000	2.50000	70/08/09	70/08/09
00403	LAB	PH	SU	3	7.23333	.003410	.058398	.008073	.033716	7.30000	7.20000	70/08/09	70/08/17
00410	T ALK	CACO3	MG/L	1	36.0000					36.0000	36.0000	70/08/17	70/08/17
31501	TOT COLI	MFIMENDO	/100ML	1	23.0000					23.0000	23.0000	70/05/29	70/05/29
31616	FEC COLI	MFM-FCBR	/100ML	7	10.0000	74.3333	8.62168	.862168	3.25869	28.0000	2.00000	70/05/29	70/08/19
31673	FECSTREP	MFKFAGAR	/100ML	6	52.1667	501.770	22.4002	.429397	9.14485	84.0000	14.0000	70/08/09	70/08/19

STORET DATE 72/11/14

571060
44 29 05.2 110 51 20.3 2
FIREHOLE R AT BRIDGE
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1143.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	11.2500	66.1250	8.13173	.722820	5.75000	17.0000	5.50000	70/05/27	70/08/12
00020	AIR	TEMP	CENT	2	15.5000	40.5000	6.36396	.410578	4.50000	20.0000	11.0000	70/05/27	70/08/12
00300	BOD	2 DAY	MG/L	1	.500000					.500000	.500000	70/06/12	70/06/12
00310	BOD	5 DAY	MG/L	1	.600000					.600000	.600000	70/08/12	70/08/12
00403	LAB	PH	SU	1	8.00000					8.00000	8.00000	70/08/12	70/08/12
31616	FEC COLI	MFM-FCBR	/100ML	1	26.0000					26.0000	26.0000	70/08/12	70/08/12
31673	FECSTREP	MFKFASAR	/100ML	1	12.0000					12.0000	12.0000	70/08/12	70/08/12

STATE DATE 72/12/28

571061
44 26 15.0 110 43 15.0 2
FISHDALE RIVER AT SERVICE ROAD
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	8.50000	60.5000	7.77817	.915079	5.50000	14.0000	3.00000	70/05/27	70/08/12
00020	AIR	TEMP	CENT	2	14.5000	112.500	10.6066	.731490	7.50000	22.0000	7.00000	70/05/27	70/08/12
00306	BOD	2 DAY	MG/L	1	.500000					.500000	.500000	70/08/12	70/08/12
00310	BOD	5 DAY	MG/L	1	.700000					.700000	.700000	70/08/12	70/08/12
00403	LAB	PH	SU	1	7.40000					7.40000	7.40000	70/08/12	70/08/12
31501	TOT COLI	MFIMENDO	/100ML	1	130.000					130.000	130.000	70/05/27	70/05/27
31616	FEC COLI	MFM-FCBR	/100ML	2	40.0000	2178.00	46.6690	1.16673	33.0000	73.0000	7.00000	70/05/27	70/08/12
31673	FECSTREP	MFKFAGAR	/100ML	1	8.00000					8.00000	8.00000	70/06/12	70/06/12
71900	MERCURY	HG,TOTAL	UG/L	1	.400000					.400000	.400000	71/04/06	71/04/06

STORET DATE 72/11/08

571062
44 25 15.0 110 54 25.0 2
IRON SPR. CR BLW OLD PATH LAGOON
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	12.0000	18.0000	4.24264	.353553	3.00000	15.0000	9.00000	70/05/27	70/08/12
00020	AIR	TEMP	CENT	2	19.5000	220.500	14.8492	.761500	10.5000	30.0000	9.00000	70/05/27	70/08/12
00334	BOD	2 DAY	MG/L	1	.400000					.400000	.400000	70/08/12	70/08/12
00310	BOD	5 DAY	MG/L	1	.800000					.800000	.800000	70/08/12	70/08/12
00403	LAB	PH	SU	1	7.50000					7.50000	7.50000	70/08/12	70/08/12
31501	TOT COLI	MFIMENDO	/100ML	1	170.000					170.000	170.000	70/05/27	70/05/27
31616	FEC COLI	MFM-FCBR	/100ML	2	89.5000	12960.5	113.844	1.27200	80.5000	170.000	9.00000	70/05/27	70/08/12
31673	FECSTREP	MFKFASAR	/100ML	1	44.0000					44.0000	44.0000	70/08/12	70/08/12

STREET AT 7[illegible]/12/[illegible]

571[illegible]3
[illegible] 27 30.0 110 5[illegible] 20.5 [illegible]
IRON SP OR ABOVE OLD FAITH LAGN
5[illegible] WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117M3R 77777717
0000

INDEX 1021500
MILES 1149.40

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	13.0000	93.0000	9.89949	.761500	7.00000	20.0000	6.00000	70/05/27	70/08/12
00020	AIR	TEMP	CENT	2	16.5000	112.500	10.6066	.642824	7.50000	24.0000	9.00000	70/05/27	70/08/12
00304	BOD	2 DAY	MG/L	1	.400000					.400000	.400000	70/08/12	70/08/12
00310	BOD	5 DAY	MG/L	1	.600000					.600000	.600000	70/08/12	70/08/12
00403	LAB	PH	SU	1	7.50000					7.50000	7.50000	70/08/12	70/08/12
31501	TOT COLI	MFIMENDO	/100ML	1	60.0000					60.0000	60.0000	70/05/27	70/05/27
31616	FEC COLI	MFM-FCBR	/100ML	2	25.5000	924.500	30.4056	1.29365	21.5000	45.0000	2.00000	70/05/27	70/08/12
31673	FECSTREP	MFKFAGAR	/100ML	1	33.0000					33.0000	33.0000	70/08/12	70/08/12

STORET DATE 72/11/29

571064
44 44 30.5 110 28 50.0 2
CANYON VILLAGE STP INF. AND EFF.
56 WYOMING
MISSOURI RIVER
YELLOWSTONE RIVER
1117MBR 77777777
0000

INDEX 102150
MILES 1149.40

PARAMETER			NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00310 BOD	5 DAY	MG/L	2	123.500	1984.50	44.5477	.360710	31.5000	155.000	92.0000	70/08/16	70/08/16
31616 FEC COLI	MEM-FC BK	/100ML	2	1250000	.312E+13	1767767	1.41421	1250000	2500000	1.00000	70/08/16	70/08/16
31673 FECSTREP	MFKFAGAR	/100ML	2	1150000	.264E+13	1626346	1.41421	1150000	2300000	1.00000	70/08/16	70/08/16

ST[illegible] DATE 72/11/2[illegible]

[illegible]
[illegible] 11[illegible] 27 [illegible]
HEART LAKE OUTLET
60 WYOMING
PACIFIC NORTHWEST
COLUMBIA
1117[illegible] 77777777
0000

PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00070	TURB	JKSN	JTU	1	.350000					.350000	.350000	70/10/18	70/10/18
00095	CNDUCTVY	AT 25C	MICROMHO	2	1[illegible].000	2450.00	4[illegible].4975	.263264	35.0000	223.000	153.000	70/06/08	70/10/18
00400	PH		SU	1	7.50000					7.50000	7.50000	70/10/18	70/10/18
00403	LAB	PH	SU	1	7.40000					7.40000	7.40000	70/06/08	70/06/08
00410	T ALK	CACO3	MG/L	2	35.0000	50.0000	7.07107	.202030	5.00000	40.0000	30.0000	70/06/08	70/10/18
00500	RESIDUE	TOTAL	MG/L	1	125.000					125.000	125.000	70/06/08	70/06/08
00515	RESIDUE	DISS-105	C MG/L	2	127.500	420.500	20.5061	.160832	14.5000	142.000	113.000	70/06/08	70/10/18
00610	NH3-N	TOTAL	MG/L	2	.010000	-.145E-10	.000000		.000000	.010000	.010000	70/06/08	70/10/18
00625	TOT KJEL	N	MG/L	1	.040000					.040000	.040000	70/06/08	70/06/08
00630	NO2&NO3	N-TOTAL	MG/L	2	.015000	.000050	.007071	.471404	.005000	.020000	.010000	70/06/08	70/10/18
00665	PHOS-T	P-WET	MG/L	2	.060000	.000200	.014142	.235704	.010000	.070000	.050000	70/06/08	70/10/18
00670	T ORG C	C	MG/L	2	9.75000	3.12500	1.76777	.181309	1.25000	11.0000	8.50000	70/10/18	70/10/18
00910	CALCIUM	CACO3	MG/L	1	4.20000					4.20000	4.20000	70/10/18	70/10/18
00915	CALCIUM	CA,DISS	MG/L	1	2.90000					2.90000	2.90000	70/06/08	70/06/08
00925	MGNSIUM	MG,DISS	MG/L	2	.750000	.045001	.212134	.282846	.150002	.900000	.600000	70/06/08	70/10/18
00930	SODIUM	NA,DISS	MG/L	2	27.0000	242.000	15.5563	.576161	11.0000	38.0000	16.0000	70/06/08	70/10/18
00935	PTSSIUM	K,DISS	MG/L	1	2.50000					2.50000	2.50000	70/06/08	70/06/08
00940	CHLORIDE	CL	MG/L	1	26.0000					26.0000	26.0000	70/10/18	70/10/18
00945	SULFATE	SO4	MG/L	1	17.0000					17.0000	17.0000	70/10/18	70/10/18
01045	IRON	TOTAL	UG/L	2	230.000	33800.0	183.848	.799338	130.000	360.000	100.000	70/06/08	70/10/18
01049	LEAD	PB,DISS	UG/L	1	.000000					.000000	.000000	70/06/08	70/06/08
01055	MANGNESE	MN	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/06/08	70/10/18
01090	ZINC	ZN,DISS	UG/L	1	.000000					.000000	.000000	70/06/08	70/06/08
70507	PHOS-T	ORTHO	MG/L P	2	.040000	.000200	.014142	.353554	.010000	.050000	.030000	70/06/08	70/10/18

STORET DATE 72/11/23

571993
44 20 30.0 110 46 30.0 3
SHOSHONE LAKE NEAR PATROL CABIN
60 WYOMING
PACIFIC NORTHWEST
COLUMBIA
1117MBR 77777777
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PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00070	TURB	JKSN	JTU	2	.350000	.045000	.212132	.606092	.150000	.500000	.200000	70/06/26	70/10/17
00095	CNDUCTVY	AT 25C	MICROMHO	2	141.500	5724.50	75.6604	.534703	53.5000	195.000	88.0000	70/06/26	70/10/17
00400	PH		SU	1	7.30000					7.30000	7.30000	70/10/17	70/10/17
00403	LAB	PH	SU	1	7.20000					7.20000	7.20000	70/06/26	70/06/26
00410	T ALK	CACO3	MG/L	2	22.5000	.500000	.707107	.031427	.500000	23.0000	22.0000	70/06/26	70/10/17
00500	RESIDUE	TOTAL	MG/L	1	102.000					102.000	102.000	70/06/26	70/06/26
00515	RESIDUE	DISS-105	C MG/L	2	81.5000	264.500	16.2635	.199552	11.5000	93.0000	70.0000	70/06/26	70/10/17
00620	NH3-N	TOTAL	MG/L	2	.015000	.000050	.007071	.471404	.005000	.020000	.010000	70/06/26	70/10/17
00625	TOT KJEL	N	MG/L	1	.050000					.050000	.050000	70/06/26	70/06/26
00630	NO2NO3	N-TOTAL	MG/L	2	.005000	.000050	.007071	1.41421	.005000	.010000	.000000	70/06/26	70/10/17
00665	PHOS-T	P-WET	MG/L	2	.060000	.001800	.042426	.707106	.030000	.090000	.030000	70/06/26	70/10/17
00680	T ORG C	C	MG/L	3	3.50000	4.71001	2.17025	.620073	1.25300	6.00000	2.10000	70/06/26	70/10/17
00910	CALCIUM	CACO3	MG/L	1	2.70000					2.70000	2.70000	70/10/17	70/10/17
00915	CALCIUM	CA,DISS	MG/L	1	3.10000					3.10000	3.10000	70/06/26	70/06/26
00925	MGNSIUM	MG,DISS	MG/L	2	.400000	.000000	.000000		.000000	.400000	.400000	70/06/26	70/10/17
00930	SODIUM	NA,DISS	MG/L	2	13.0000	.000000	.000000		.000000	13.0000	13.0000	70/06/26	70/10/17
00935	PTSSIUM	K,DISS	MG/L	1	3.20000					3.20000	3.20000	70/06/26	70/06/26
00940	CHLORIDE	CL	MG/L	2	7.00000	.000000	.000000		.000000	7.00000	7.00000	70/06/26	70/10/17
00945	SULFATE	SO4	MG/L	2	15.8000	237.680	17.2534	1.09199	12.2000	28.0000	3.60000	70/06/26	70/10/17
00950	FLUORIDE	F,DISS	MG/L	1	1.30000					1.30000	1.30000	70/06/26	70/06/26
01005	BARIUM	BA,DISS	UG/L	1	.000000					.000000	.000000	70/06/26	70/06/26
01040	COPPER	CU-DISS	UG/L	1	.000000					.000000	.000000	70/06/26	70/06/26
01045	IRON	TOTAL	UG/L	2	50.0000	5000.00	70.7107	1.41421	50.0000	100.000	.000000	70/06/26	70/10/17
01049	LEAD	PB,DISS	UG/L	1	.000000					.000000	.000000	70/06/26	70/06/26
01055	MANGNESE	MN	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/06/26	70/10/17
01090	ZINC	ZN,DISS	UG/L	1	.000000					.000000	.000000	70/06/26	70/06/26
70507	PHOS-T	ORTHO	MG/L P	2	.040000	.000200	.014142	.353554	.010000	.050000	.030000	70/06/26	70/10/17

STREET DATE 72/11/30

571594
44 20 00.0 110 44 02.0 3
LEWIS LAKE AT INLET TO LAKE
60 WYOMING
PACIFIC NORTHWEST
COLUMBIA
11178BK 77777777
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PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	2	18.2500	1.13500	1.06605	.058118	.750000	19.0000	17.5000	70/07/23	70/07/31
00020	AIR	TEMP	CENT	2	20.0000	2.00000	1.41421	.070711	1.00000	21.0000	19.0000	70/07/23	70/07/31
00070	TURB	JKSN	JTU	3	.633333	.103334	.321455	.507562	.185593	1.00000	.400000	70/06/20	70/07/31
00095	CNDUCTVY	AT 25C	MICROMHO	3	87.3333	2.34570	1.53157	.017537	.884251	89.0000	86.0000	70/06/20	70/07/31
00300	DO		MG/L	2	7.90000	.020004	.141436	.017903	.100011	8.00000	7.80000	70/07/23	70/07/31
00400	PH		SU	2	7.60000	.320023	.565705	.074435	.400014	8.00000	7.20000	70/07/23	70/07/31
00403	LAB	PH	SU	3	7.20000	.120356	.346491	.048124	.200047	7.60000	7.00000	70/06/20	70/07/31
00410	T ALK	CACO3	MG/L	3	24.0000	1.00000	1.00000	.041667	.577350	25.0000	23.0000	70/06/20	70/07/31
00500	RESIDUE	TOTAL	MG/L	3	149.333	576.354	24.0074	.165186	13.8607	169.000	121.000	70/06/20	70/07/31
00515	RESIDUE	DISS-105	MG/L	3	86.6667	160.346	12.6628	.146139	7.31085	101.000	77.0000	70/06/20	70/07/31
00610	NH3-N	TOTAL	MG/L	3	.006667	.000033	.005774	.866026	.003333	.010000	.000000	70/06/20	70/07/31
00625	TOT KJEL	N	MG/L	3	.206667	.023333	.152753	.739126	.086192	.340000	.040000	70/06/20	70/07/31
00630	NO2&NO3	N-TOTAL	MG/L	3	.013333	.000233	.015275	1.14564	.008819	.030000	.000000	70/06/20	70/07/31
00665	PHOS-T	P-WET	MG/L	3	.036667	.000433	.020817	.567727	.012019	.060000	.020000	70/06/20	70/07/31
00680	T ORG C	C	MG/L	3	3.23333	3.41333	1.84752	.571393	1.06667	4.30000	1.10000	70/06/20	70/07/31
00915	CALCIUM	CA,DISS	MG/L	3	2.36667	.173340	.416341	.175919	.240375	2.70000	1.90000	70/06/20	70/07/31
00925	MGNSIUM	MG,DISS	MG/L	3	.533333	.053334	.230941	.433015	.133334	.800000	.400000	70/06/20	70/07/31
00930	SODIUM	NA,DISS	MG/L	3	13.6667	1.33350	1.15477	.084495	.666707	15.0000	13.0000	70/06/20	70/07/31
00935	POTSIUM	K,DISS	MG/L	3	3.20000	.010002	.100011	.031253	.057741	3.30000	3.10000	70/06/20	70/07/31
00940	CHLORIDE	CL	MG/L	3	6.66667	.333337	.577405	.086611	.333355	7.00000	6.00000	70/06/20	70/07/31
00945	SULFATE	SO4	MG/L	3	5.46666	1.35341	1.36140	.249037	.786004	7.00000	4.40000	70/06/20	70/07/31
00950	FLORIDE	F,DISS	MG/L	3	2.06667	.443337	.665836	.322179	.384420	2.50000	1.30000	70/06/20	70/07/31
00955	SILICA	DISSOLVED	MG/L	2	35.0000	2.00000	1.41421	.040406	1.00000	36.0000	34.0000	70/07/23	70/07/31
01005	BARIUM	BA,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/20	70/07/31
01040	COPPER	CU-DISS	UG/L	3	.066667	.013333	.115470	1.73205	.066667	.200000	.000000	70/06/20	70/07/31
01045	IRON	TOTAL	UG/L	3	40.0000	4800.00	69.2820	1.73205	40.0000	120.000	.000000	70/06/20	70/07/31
01049	LEAD	PB,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/20	70/07/31
01055	MANGNESE	MN	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/20	70/07/31
01090	ZINC	ZN,DISS	UG/L	3	.000000	.000000	.000000		.000000	.000000	.000000	70/06/20	70/07/31
70507	PHOS-T	ORTHO	MG/L P	3	.026667	.000433	.020817	.780626	.012019	.050000	.010000	70/06/20	70/07/31

STARET DATE 72/12/23

57[illegible]
46 17 30.0 116 37 00.0 3
LEWIS LAKE AT LEWIS L. CAMP AREA
60 WYOMING
PACIFIC NORTHWEST
COLUMBIA
1117MBR 77777777
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PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	14	4.10714	71.7761	8.47208	1.04501	2.26426	20.0000	.000000	70/05/08	70/07/31
00011	AIR	TEMP	CENT	14	13.0714	67.3407	8.20614	.604663	2.19315	24.0000	2.00000	70/05/08	70/07/31
00076	TURB	JKSN	JTU	6	1.10000	.992001	.995993	.905448	.406612	3.00000	.400000	70/05/08	70/07/31
00095	CNDUCTVY	AT 25C	MICROMHO	4	70.7500	800.916	28.3005	.400006	14.1502	92.0000	31.0000	70/05/08	70/07/31
00300	OXY		MG/L	4	7.59999	.913427	.955734	.125754	.477867	8.90000	6.60000	70/05/08	70/07/31
00310	BOD	2 DAY	MG/L	5	.380000	.032000	.178886	.470754	.080000	.600000	.200000	70/05/20	70/07/28
00310	BOD	5 DAY	MG/L	5	.699999	.070000	.264576	.377966	.118322	1.10000	.400000	70/05/20	70/07/28
00400	PH		SU	5	7.19999	.103333	.321074	.044643	.143569	7.60000	6.80000	70/05/08	70/07/31
00403	LAB	PH	SU	5	6.76666	.527436	.726289	.107333	.242096	7.80000	5.80000	70/05/08	70/07/31
00410	T ALK	CACO3	MG/L	6	22.9667	49.9270	7.06551	.307659	2.88464	26.0000	8.80000	70/05/08	70/07/31
00500	RESIDUE	TOTAL	MG/L	4	119.750	2372.92	48.7126	.406786	24.3563	157.000	50.0000	70/05/08	70/07/31
00515	RESIDUE	DISS-105	C MG/L	4	95.5000	1603.67	40.0458	.419328	20.0229	143.000	49.0000	70/05/08	70/07/31
00610	NH3-N	TOTAL	MG/L	4	.055000	.003100	.055678	1.01232	.027839	.130000	.000000	70/05/08	70/07/31
00625	TOT KJEL	N	MG/L	4	.173000	.002333	.048304	.284143	.024152	.240000	.130000	70/05/08	70/07/31
00630	NO2&NO3	N-TOTAL	MG/L	4	.052500	.003625	.061847	1.17803	.030923	.120000	.000000	70/05/08	70/07/31
00665	PHOS-T	P-WET	MG/L	4	.080000	.003600	.060000	.750000	.030000	.130000	.010000	70/05/08	70/07/31
00680	T ORG C	C	MG/L	4	1.77500	.089167	.298608	.168230	.149304	2.20000	1.50000	70/05/08	70/07/31
00915	CALCIUM	CA,DISS	MG/L	4	2.02500	.209162	.457343	.151188	.228671	3.70000	2.70000	70/05/08	70/07/31
00925	MAGNSIUM	MG,DISS	MG/L	4	.400000	.000000	.000345	.000863	.000173	.400000	.400000	70/05/08	70/07/31
00930	SODIUM	NA,DISS	MG/L	4	13.0000	2.00000	1.41421	.108786	.707107	15.0000	12.0000	70/05/08	70/07/31
00935	POTSSIUM	K,DISS	MG/L	4	2.82500	.255834	.505800	.179044	.252900	3.40000	2.40000	70/05/08	70/07/31
00940	CHLORIDE	CL	MG/L	4	7.50000	1.00000	1.00000	.133333	.500000	9.00000	7.00000	70/05/08	70/07/31
00945	SULFATE	SO4	MG/L	4	6.87500	20.2092	4.49547	.653886	2.24773	13.0000	2.30000	70/05/08	70/07/31
00950	FLUORIDE	F,DISS	MG/L	4	2.05000	.830002	.911044	.444412	.455522	2.60000	.700000	70/05/08	70/07/31
00955	SILICA	DISSOLVED	MG/L	2	36.0000	.000000	.000000		.000000	36.0000	36.0000	70/07/20	70/07/31
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
01045	IRON	TOTAL	UG/L	3	116.667	10833.3	104.083	.892143	60.0926	200.000	.000000	70/05/08	70/07/31
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
01055	MANGNESE	MN	UG/L	4	17.5000	425.000	20.6155	1.17803	10.3078	40.0000	.000000	70/05/08	70/07/31
01097	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
31501	TOT COLI	MFI4FCBD	/100ML	5	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/05/16	70/05/22
31616	FEC COLI	MFM-FCBR	/100ML	10	1.00000	.000000	.000000		.000000	1.00000	1.00000	70/05/16	70/07/29
31673	FECSTREP	MFKFBGAR	/100ML	5	10.4000	178.300	13.3529	1.28393	5.97160	33.0000	1.00000	70/07/25	70/07/29
70507	PHOS-T	ORTHO	MG/L P	4	.007000	.000013	.003559	.508433	.001780	.010000	.003000	70/05/08	70/07/31

STORET DATE 72/11/24

571996
44 15 00.0 110 38 05.0 3
LEWIS R AT S. ENTRANCE RD BRDGE
60 WYOMING
PACIFIC NORTHWEST
COLUMBIA
1117MGR 77777777
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PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	14	10.3643	38.5179	6.20628	.566045	1.65870	18.0000	4.00000	70/05/06	70/07/31
00020	AIR	TEMP	CENT	14	13.9286	78.6863	8.87056	.636851	2.37076	28.0000	.000000	70/05/08	70/07/31
00060	STREAM	FLOW	CFS	1	320.000					320.000	320.000	70/07/20	70/07/20
00070	TURB	JKSN	JTU	6	.450000	.051000	.225833	.501351	.092196	.900000	.300000	70/05/08	70/07/31
00095	CNDUCTVY	AT 25C	MICROMHO	4	109.250	523.583	22.8819	.209446	11.4410	142.000	93.0000	70/05/08	70/07/31
00300	DO		MG/L	3	8.89999	.090141	.300235	.033734	.173341	9.20000	8.60000	70/05/08	70/07/31
00304	BOD	2 DAY	MG/L	5	.520000	.012000	.109546	.210666	.048990	.600000	.400000	70/05/20	70/07/28
00310	BOD	5 DAY	MG/L	5	.700000	.040001	.200002	.285717	.089443	.900000	.400000	70/05/20	70/07/28
00400	PH		SU	4	7.17500	.049250	.221924	.030930	.110962	7.50000	7.00000	70/05/08	70/07/31
00403	LAB	PH	SU	9	7.27777	.039459	.198643	.027295	.066214	7.50000	6.90000	70/05/08	70/07/31
00410	T ALK	CACO3	MG/L	6	30.1667	44.1680	6.64590	.220306	2.71318	42.0000	25.0000	70/05/08	70/07/31
00500	RESIDUE	TOTAL	MG/L	4	144.500	2433.67	49.3322	.341399	24.6661	218.000	113.000	70/05/08	70/07/31
00515	RESIDUE	DISS-105	C MG/L	4	105.000	1276.00	35.7491	.340468	17.8746	141.000	57.0000	70/05/08	70/07/31
00610	NH3-N	TOTAL	MG/L	4	.012500	.000158	.012583	1.00664	.006292	.030000	.000000	70/05/08	70/07/31
00625	TOT KJEL	N	MG/L	4	.022500	.000692	.026300	1.16887	.013150	.050000	.000000	70/05/08	70/07/31
00630	NO2&NO3	N-TOTAL	MG/L	4	.007500	.000225	.015000	2.00000	.007500	.030000	.000000	70/05/08	70/07/31
00665	PHOS-T	P-WET	MG/L	4	.042500	.001558	.039476	.928841	.019738	.100000	.010000	70/05/08	70/07/31
00680	T ORG C	C	MG/L	4	1.30000	.353335	.594420	.457247	.297210	2.00000	.600000	70/05/08	70/07/31
00915	CALCIUM	CA,DISS	MG/L	4	3.57500	.542491	.736540	.206025	.368270	4.30000	2.80000	70/05/08	70/07/31
00925	MGNSIUM	MG,DISS	MG/L	4	.500000	.020000	.141422	.282844	.070711	.700000	.400000	70/05/08	70/07/31
00930	SODIUM	NA,DISS	MG/L	4	17.7500	10.9167	3.30404	.186143	1.65202	22.0000	14.0000	70/05/08	70/07/31
00935	POTSSIUM	K,DISS	MG/L	4	3.50000	.046661	.216012	.061718	.108006	3.80000	3.30000	70/05/08	70/07/31
00940	CHLORIDE	CL	MG/L	4	9.75000	4.91667	2.21736	.227421	1.10868	12.0000	7.00000	70/05/06	70/07/31
00945	SULFATE	SO4	MG/L	4	6.60000	5.30669	2.30363	.349034	1.15181	10.0000	5.00000	70/05/08	70/07/31
00950	FLUORIDE	F,DISS	MG/L	4	2.85000	.136668	.369686	.129714	.184843	3.30000	2.50000	70/05/08	70/07/31
00955	SILICA	DISOLVED	MG/L	2	38.0000	.000000	.000000		.000000	38.0000	38.0000	70/07/20	70/07/31
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/06	70/07/31
01045	IRON	TOTAL	UG/L	3	66.6667	3333.34	57.7350	.866026	33.3333	100.000	.000000	70/05/08	70/07/31
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/06	70/07/31
01055	MANGNESE	MN	UG/L	4	22.5000	691.666	26.2996	1.16887	13.1498	50.0000	.000000	70/05/08	70/07/31
01090	ZINC	ZN,DISS	UG/L	4	2.50000	25.0000	5.00000	2.00000	2.50000	10.0000	.000000	70/05/06	70/07/31
09503	RA-226	DISOLVED	PC/L	1	.010000					.010000	.010000	70/05/08	70/05/08
22703	U-NAT	DISOLVED	UG/L	1	.400000					.400000	.400000	70/05/08	70/05/08
31501	TOT COLI	MFIMENDO	/100ML	5	7.60000	22.3000	4.72229	.621354	2.11187	14.0000	3.00000	70/05/18	70/05/22
31616	FEC COLI	MFM-FCBR	/100ML	10	3.00000	35.7778	5.98145	1.99382	1.89150	20.0000	1.00000	70/05/18	70/07/29
31673	FECSTREP	MFKFAGAR	/100ML	5	7.00000	165.500	12.8647	1.83781	5.75326	30.0000	1.00000	70/07/25	70/07/29
70507	PHOS-T	ORTHO	MG/L P	4	.014500	.000051	.007141	.492513	.003571	.020000	.005000	70/05/08	70/07/31

STORET DATE 72/11/28

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SNAKE R. ABOVE LEWIS R. JUNC.
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PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WATER	TEMP	CENT	1	16.0000					16.0000	16.0000	70/07/31	70/07/31
00020	AIR	TEMP	CENT	1	23.0000					23.0000	23.0000	70/07/31	70/07/31
00070	TURB	JKSN	JTU	3	16.8833	822.541	28.6800	1.69871	16.5584	50.0000	.250000	70/06/28	70/10/20
00095	CNDUCTVY	AT 25C	MICROMHO	3	169.333	8597.37	92.7220	.547571	53.5331	276.000	108.000	70/06/28	70/10/20
00300	DO		MG/L	1	8.40000					8.40000	8.40000	70/07/31	70/07/31
00400	PH		SU	6	7.60000	.720016	.848538	.111650	.600007	8.20000	7.00000	70/07/31	70/10/20
00403	LAB	PH	SU	2	7.55000	.044998	.212128	.028096	.149997	7.70000	7.40000	70/06/28	70/07/31
00410	T ALK	CACO3	MG/L	3	48.6667	312.336	17.6730	.363145	10.2035	69.0000	37.0000	70/06/28	70/10/20
00500	RESIDUE	TOTAL	MG/L	2	211.000	6498.00	80.6102	.382039	57.0000	268.000	154.000	70/06/28	70/07/31
00515	RESIDUE	DISS-105	C MG/L	3	113.667	3969.35	63.0028	.554277	36.3747	177.000	51.0000	70/06/28	70/10/20
00610	NH3-N	TOTAL	MG/L	3	.013333	.000233	.015275	1.14564	.008819	.030000	.000000	70/06/28	70/10/20
00625	TOT KJEL	N	MG/L	2	.470000	.080000	.282843	.601793	.200000	.670000	.270000	70/06/28	70/07/31
00630	NO2&NO3	N-TOTAL	MG/L	3	.006667	.000033	.005774	.866026	.003333	.010000	.000000	70/06/28	70/10/20
00665	PHOS-T	P-WET	MG/L	3	.113333	.014033	.118462	1.04526	.066394	.250000	.040000	70/06/28	70/10/20
00680	T ORG C	C	MG/L	4	8.67500	32.4826	5.69935	.656985	2.84967	17.0000	4.70000	70/06/28	70/10/20
00910	CALCIUM	CACO3	MG/L	1	17.0000					17.0000	17.0000	70/10/20	70/10/20
00915	CALCIUM	CA,DISS	MG/L	2	7.15000	16.2450	4.03051	.563708	2.85000	10.0000	4.30000	70/06/28	70/07/31
00925	MGNSIUM	MG,DISS	MG/L	3	2.26667	1.84333	1.35769	.598982	.783864	3.10000	.700000	70/06/28	70/10/20
00930	SODIUM	NA,DISS	MG/L	2	24.5000	60.5000	7.77817	.317476	5.50000	30.0000	19.0000	70/07/31	70/10/20
00935	PTSSIUM	K,DISS	MG/L	1	3.30000					3.30000	3.30000	70/07/31	70/07/31
00940	CHLORIDE	CL	MG/L	3	9.33333	36.3335	6.02773	.645828	3.48011	15.0000	3.00000	70/06/28	70/10/20
00945	SULFATE	SO4	MG/L	3	26.1667	270.084	16.4342	.628060	9.48831	41.0000	8.50000	70/06/28	70/10/20
00950	FLUORIDE	F,DISS	MG/L	2	1.30000	2.42000	1.55564	1.19664	1.10000	2.40000	.200000	70/06/28	70/07/31
00955	SILICA	DISOLVED	MG/L	1	36.0000					36.0000	36.0000	70/07/31	70/07/31
01005	BARIUM	BA,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/06/28	70/07/31
01040	COPPER	CU-DISS	UG/L	1	.000000					.000000	.000000	70/07/31	70/07/31
01045	IRON	TOTAL	UG/L	2	50.0000	5000.00	70.7107	1.41421	50.0000	100.000	.000000	70/07/31	70/10/20
01049	LEAD	PB,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/06/28	70/07/31
01055	MANGNESE	MN	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/07/31	70/10/20
01090	ZINC	ZN,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/06/28	70/07/31
70507	PHOS-T	ORTHO	MG/L P	3	.030000	.000100	.010000	.333336	.005774	.040000	.020000	70/06/28	70/10/20

STORET DATE 72/11/23

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SNAKE R. AT SOUTH PARK BOUNDARY
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PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
00010	WAT-P	TEMP	CENT	14	9.85714	40.5550	6.36828	.646057	1.70199	19.0000	2.00000	70/05/06	70/07/31
00020	AIR	TEMP	CENT	14	14.8571	58.2857	7.63451	.513861	2.04041	26.0000	2.00000	70/05/06	70/07/31
00070	TURB	JKSN	JTU	6	12.7167	662.525	25.7396	2.02408	10.5081	65.0000	.500000	70/05/06	70/07/31
00095	CNDUCTVY	AT 25C	MICROMHO	4	164.500	1569.67	39.6190	.240845	19.8095	199.000	108.000	70/05/06	70/07/31
00300	OD		MG/L	4	8.57500	.922607	.960525	.112015	.480262	9.50000	7.40000	70/05/06	70/07/31
00304	BOD	2 DAY	MG/L	5	.660000	.037000	.192354	.282874	.086023	.900000	.400000	70/05/20	70/07/28
00310	BOD	5 DAY	MG/L	5	1.08000	.277002	.526309	.487324	.235373	1.80000	.500000	70/05/20	70/07/28
00400	PH		SU	4	7.19999	.033447	.182886	.025401	.091443	7.40000	7.00000	70/05/08	70/07/31
00403	LAB	PH	SU	9	7.44444	.282806	.531795	.071435	.177265	8.60000	6.70000	70/05/06	70/07/31
00410	T ALK	CACO3	MG/L	6	55.6667	135.870	11.6563	.209395	4.75868	70.0000	37.0000	70/05/08	70/07/31
00500	RESIDUE	TOTAL	MG/L	4	155.500	351.000	18.7350	.120482	9.36750	181.000	136.000	70/05/08	70/07/31
00515	RESIDUE	DISS-105	C MG/L	4	127.250	1620.92	40.2606	.316390	20.1303	180.000	89.0000	70/05/08	70/07/31
00610	NH3-N	TOTAL	MG/L	4	.007500	.000025	.005000	.666667	.002500	.010000	.000000	70/05/08	70/07/31
00625	TOT KJEL	N	MG/L	4	.070000	.003000	.054772	.782463	.027386	.130000	.000000	70/05/06	70/07/31
00630	NO2&NO3	N-TOTAL	MG/L	4	.015000	.000300	.017321	1.15470	.008660	.030000	.000000	70/05/06	70/07/31
00665	PHOS-T	P-WET	MG/L	4	.027500	.000225	.015000	.545455	.007500	.040000	.010000	70/05/06	70/07/31
00680	T ORG C	C	MG/L	4	3.17500	1.36916	1.17011	.368539	.585056	4.70000	1.90000	70/05/06	70/07/31
00720	CYANIDE	CN	MG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/05/25
00915	CALCIUM	CA,DISS	MG/L	4	12.2500	2.25000	1.50000	.122449	.750000	14.0000	11.0000	70/05/06	70/07/31
00925	MGNSIUM	MG,DISS	MG/L	4	2.40000	.406662	.637701	.265709	.318850	2.90000	1.50000	70/05/08	70/07/31
00930	SODIUM	NA,DISS	MG/L	4	18.2500	12.9167	3.59398	.196930	1.79699	21.0000	13.0000	70/05/08	70/07/31
00935	PTSSIUM	K,DISS	MG/L	4	3.47500	2.38250	1.54353	.444183	.771767	5.60000	2.00000	70/05/08	70/07/31
00940	CHLORIDE	CL	MG/L	4	9.75000	6.91667	2.62996	.269739	1.31498	12.0000	6.00000	70/05/08	70/07/31
00945	SULFATE	SO4	MG/L	4	16.7500	19.5833	4.42531	.264197	2.21265	21.0000	12.0000	70/05/08	70/07/31
00951	FLUORIDE	F,DISS	MG/L	4	1.82500	.169168	.411301	.225371	.205650	2.30000	1.30000	70/05/08	70/07/31
00955	SILICA	DISOLVED	MG/L	2	31.5000	.500000	.707107	.022446	.500000	32.0000	31.0000	70/07/20	70/07/31
01000	ARSENIC	AS,DISS	UG/L	4	22.5000	25.0000	5.00000	.222222	2.50000	30.0000	20.0000	70/05/06	70/07/31
01005	BARIUM	BA,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
01020	BORON	B,DISS	UG/L	3	90.0000	5200.00	72.1110	.801234	41.6333	150.000	10.0000	70/05/25	70/07/31
01021	BORON	B,SUSP	UG/L	1	.000000					.000000	.000000	70/05/08	70/05/08
01040	COPPER	CU-DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
01045	IRON	TOTAL	UG/L	4	187.500	57291.7	239.357	1.27657	119.678	500.000	.000000	70/05/06	70/07/31
01049	LEAD	PB,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
01055	MANGNESE	MN	UG/L	4	20.0000	1600.00	40.0000	2.00000	20.0000	60.0000	.000000	70/05/08	70/07/31
01090	ZINC	ZN,DISS	UG/L	4	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
01145	SELENIUM	SE,DISS	UG/L	2	.000000	.000000	.000000		.000000	.000000	.000000	70/05/08	70/07/31
09503	RA-226	DISOLVED	PC/L	1	.090000					.090000	.090000	70/05/06	70/05/08
22703	U-NAT	DISOLVED	UG/L	1	.200000					.200000	.200000	70/05/08	70/05/08
31501	TOT COLI	MFIMEMDO	/100ML	5	130.800	15006.7	122.502	.936559	54.7845	340.000	23.0000	70/05/18	70/05/22

STORET DATE 72/11/23

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SNAKE R. AT SOUTH PARK BOUNDARY
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PARAMETER				NUMBER	MEAN	VARIANCE	STAN DEV	COEF VAR	STAND ER	MAXIMUM	MINIMUM	BEG DATE	END DATE
31616	FEC COLI	MFM-FCBR	/100ML	10	60.2000	7620.39	87.2949	1.45008	27.6051	300.000	1.00000	70/05/18	70/07/29
31673	FECSTREP	MFKFAGAR	/100ML	5	58.0000	2931.50	54.1433	.933506	24.2136	150.000	22.0000	70/07/25	70/07/29
32730	PHENOLS		UG/L	2	2.20000	3.38000	1.83848	.835672	1.30000	3.50000	.900000	70/05/08	70/05/25
38260	MBAS		MG/L	3	.033333	.000933	.030551	.916516	.017638	.060000	.000000	70/05/08	70/07/31
39365	DDE	WHL SMPL	UG/L	1	.030000					.030000	.030000	70/07/20	70/07/20
39370	DDT	WHL SMPL	UG/L	1	.020000					.020000	.020000	70/07/20	70/07/20
70507	PHOS-T	ORTHO	MG/L P	4	.013500	.000062	.007895	.584825	.003948	.020000	.004000	70/05/08	70/07/31